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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>  
Copyright (C) <year> <name of author>
```

```
This program is free software: you can redistribute it and/or modify  
it under the terms of the GNU General Public License as published by  
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```

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```
<program> Copyright (C) <year> <name of author>  
This program comes with ABSOLUTELY NO WARRANTY; for details type `show w'.  
This is free software, and you are welcome to redistribute it  
under certain conditions; type `show c' for details.
```

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## 1.2 avahi 0.6.32

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```

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```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE article PUBLIC "-//Boost//DTD BoostBook XML V1.0//EN"
"http://www.boost.org/tools/boostbook/dtd/boostbook.dtd">
<article id="copyright_test" last-revision="DEBUG MODE Date: 2000/12/20 12:00:00 $"
xmlns:xi="http://www.w3.org/2001/XInclude">
<title>Copyright Test</title>
<articleinfo>
<copyright>
<year>1963</year> <year>1964</year> <year>1965</year> <holder>Jane Doe</holder>
</copyright>
<copyright>
<year>2018</year> <holder>Joe Blow, John Coe</holder>
</copyright>
```

```
<copyright>
  <year>1977</year> <year>1985</year> <holder>Someone else</holder>
</copyright>
</articleinfo>
</article>
Software License, Version 1.0
```

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This is an attempt to acknowledge early contributions to the garbage collector. Later contributions should instead be mentioned in README.changes.

#### HISTORY -

Early versions of this collector were developed as a part of research projects supported in part by the National Science Foundation and the Defense Advance Research Projects Agency.

The garbage collector originated as part of the run-time system for the Russell programming language implementation. The first version of the garbage collector was written primarily by Al Demers. It was then refined and mostly rewritten, primarily by Hans-J. Boehm, at Cornell U., the University of Washington, Rice University (where it was first used for C and assembly code), Xerox PARC, SGI, and HP Labs. However, significant contributions have also been made by many others.

Some other contributors:

More recent contributors are mentioned in the modification history in README.changes. My apologies for any omissions.

The SPARC specific code was originally contributed by Mark Weiser.

The Encore Multimax modifications were supplied by Kevin Kenny (kenny@m.cs.uiuc.edu). The adaptation to the IBM PC/RT is largely due to Vernon Lee, on machines made available to Rice by IBM.

Much of the HP specific code and a number of good suggestions for improving the generic code are due to Walter Underwood.

Robert Brazile (brazile@diamond.bbn.com) originally supplied the ULTRIX code.

Al Dosser (dosser@src.dec.com) and Regis Cridlig (Regis.Cridlig@cl.cam.ac.uk)

subsequently provided updates and information on variation between ULTRIX

systems. Parag Patel (parag@netcom.com) supplied the A/UX code.

Jesper Peterson(jep@mtiame.mtia.oz.au), Michel Schinz, and Martin Tauchmann (martintauchmann@bigfoot.com) supplied the Amiga port. Thomas Funke (thf@zelator.in-berlin.de(?)) and Brian D.Carlstrom (bdc@clark.lcs.mit.edu) supplied the NeXT ports. Douglas Steel (doug@wg.icl.co.uk) provided ICL DRS6000 code. Bill Janssen (janssen@parc.xerox.com) supplied the SunOS dynamic loader specific code. Manuel Serrano (serrano@cornas.inria.fr) supplied linux and Sony News specific code. Al Dosser provided Alpha/OSF/1 code. He and Dave Detlefs(detlefs@src.dec.com) also provided several generic bug fixes. Alistair G. Crooks(agg@uts.amdahl.com) supplied the NetBSD and 386BSD ports. Jeffrey Hsu (hsu@soda.berkeley.edu) provided the FreeBSD port. Brent Benson (brent@jade.ssd.csd.harris.com) ported the collector to a Motorola 88K processor running CX/UX (Harris NightHawk). Ari Huttunen (Ari.Huttunen@hut.fi) generalized the OS/2 port to nonIBM development environments (a nontrivial task). Patrick Beard (beard@cs.ucdavis.edu) provided the initial MacOS port. David Chase, then at Olivetti Research, suggested several improvements. Scott Schwartz (schwartz@groucho.cse.psu.edu) supplied some of the code to save and print call stacks for leak detection on a SPARC. Jesse Hull and John Ellis supplied the C++ interface code. Zhong Shao performed much of the experimentation that led to the current typed allocation facility. (His dynamic type inference code hasn't made it into the released version of the collector, yet.) This package was debianized by Vladimir Prus <ghost@cs.msu.su> on Wed, 17 July 2002, 19:27:00 +0400.

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Julian Seward, Cambridge, UK.  
jseward@acm.org  
bzip2/libbz2 version 1.0.2 of 30 December 2001

/\*

minibz2

libbz2.dll test program.

by Yoshioka Tsuneo (tsuneo@rr.iij4u.or.jp)

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usage: minibz2 [-d] [-{1,2,..9}] [[srcfilename] destfilename]

\*/

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# 1.5 curl 7.65.3

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## 1.6 dnsmasq 2.78

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## 1.8 glibc 2.21

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## 1.13 libcgroup 0.41

### 1.13.1 Available under license :

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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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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

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

@item

A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or

linked with it, is called a ``work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

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.

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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.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

@enumerate a

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Accompany the work with the complete corresponding

machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable ``work that uses the Library'', as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

@item

Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

@item

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.

@item

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.

@item

Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

@end enumerate

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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@enumerate a

@item

Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

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Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

@end enumerate

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@subheading END OF TERMS AND CONDITIONS

@page

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@smallexample

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@var{signature of Ty Coon}, 1 April 1990

Ty Coon, President of Vice

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Version 2.1, February 1999

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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, whereas the latter must be combined with the library in order to run.

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"Source code" for a work means the preferred form of the work for

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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.)

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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#### GCC RUNTIME LIBRARY EXCEPTION

Version 3.1, 31 March 2009

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=====

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Developed by:

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```
Program      Directory
-----      -
mach_override  lib/interception/mach_override
/* Definitions for BSD assembler syntax for Intel 386
   (actually AT&T syntax for insns and operands,
   adapted to BSD conventions for symbol names and debugging.)
   Copyright (C) 1988-2013 Free Software Foundation, Inc.
```

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```
/* Use the Sequent Symmetry assembler syntax. */
```

```
/* Define the syntax of pseudo-ops, labels and comments. */
```

```
/* Prefix for internally generated assembler labels. If we aren't using
   underscores, we are using prefix `.'s to identify labels that should
   be ignored, as in `i386/gas.h' --karl@cs.umb.edu */
```

```
#define LPREFIX "L"
```

```
/* Assembler pseudos to introduce constants of various size. */
```

```
#define ASM_BYTE "\t.byte\t"
```

```
#define ASM_SHORT "\t.word\t"
```

```
#define ASM_LONG "\t.long\t"
```

```
#define ASM_QUAD "\t.quad\t" /* Should not be used for 32bit compilation. */
```

```
/* This was suggested, but it shouldn't be right for DBX output. -- RMS
```

```
#define ASM_OUTPUT_SOURCE_FILENAME(FILE, NAME) */
```

```

/* Define the syntax of labels and symbol definitions/declarations. */

/* This is how to output an assembler line
that says to advance the location counter by SIZE bytes. */

#define ASM_OUTPUT_SKIP(FILE,SIZE) \
fprintf (FILE, "\t.space \"HOST_WIDE_INT_PRINT_UNSIGNED\"\n", (SIZE))

/* Define the syntax of labels and symbol definitions/declarations. */

/* This says how to output an assembler line
to define a global common symbol. */

#define ASM_OUTPUT_COMMON(FILE, NAME, SIZE, ROUNDED) \
( fputs (".comm ", (FILE)), \
assemble_name ((FILE), (NAME)), \
fprintf ((FILE), "%u\n", (int)(ROUNDED)))

/* This says how to output an assembler line
to define a local common symbol. */

#define ASM_OUTPUT_LOCAL(FILE, NAME, SIZE, ROUNDED) \
( fputs (".lcomm ", (FILE)), \
assemble_name ((FILE), (NAME)), \
fprintf ((FILE), "%u\n", (int)(ROUNDED)))

#ifndef HAVE_GAS_LCOMM_WITH_ALIGNMENT
#define ASM_OUTPUT_ALIGNED_LOCAL(FILE, NAME, SIZE, ALIGNMENT) \
( fputs (".lcomm ", (FILE)), \
assemble_name ((FILE), (NAME)), \
fprintf ((FILE), "%u,%u\n", (int)(SIZE), (int)(ALIGNMENT) / BITS_PER_UNIT))
#endif

/* This is how to output an assembler line
that says to advance the location counter
to a multiple of 2**LOG bytes. */

#define ASM_OUTPUT_ALIGN(FILE,LOG) \
if ((LOG)!=0) fprintf ((FILE), "\t.align %d\n", (LOG))

/* This is how to store into the string BUF
the symbol_ref name of an internal numbered label where
PREFIX is the class of label and NUM is the number within the class.
This is suitable for output with `assemble_name'. */

#define ASM_GENERATE_INTERNAL_LABEL(BUF,PREFIX,NUMBER) \

```

```

printf ((BUF), "%s%ld", (PREFIX), (long)(NUMBER))

/* The prefix to add to user-visible assembler symbols. */

#define USER_LABEL_PREFIX "_"

/* Sequent has some changes in the format of DBX symbols. */
#define DBX_NO_XREFS 1

/* Don't split DBX symbols into continuations. */
#define DBX_CONTIN_LENGTH 0

.\" Automatically generated by Pod::Man 2.25 (Pod::Simple 3.16)
.\"
.\" Standard preamble:
.\" =====
.de Sp \" Vertical space (when we can't use .PP)
.if t .sp .5v
.if n .sp
..
.de Vb \" Begin verbatim text
.ft CW
.nf
.ne \\$1
..
.de Ve \" End verbatim text
.ft R
.fi
..
.\" Set up some character translations and predefined strings. \*(-- will
.\" give an unbreakable dash, \*(PI will give pi, \*(L" will give a left
.\" double quote, and \*(R" will give a right double quote. \*(C+ will
.\" give a nicer C++. Capital omega is used to do unbreakable dashes and
.\" therefore won't be available. \*(C` and \*(C' expand to ` in nroff,
.\" nothing in troff, for use with C<>.
.tr \(*W-
.ds C+ C\v'-.1v'h'-1p's-2+\h'-1p'+\s0\v'.1v'h'-1p'
.ie n {\
. ds -- \(*W-
. ds PI pi
. if (\n(.H=4u)&(1m=24u) .ds -- \(*W'h'-12u\(*W'h'-12u-' diablo 10 pitch
. if (\n(.H=4u)&(1m=20u) .ds -- \(*W'h'-12u\(*W'h'-8u-' diablo 12 pitch
. ds L" ""
. ds R" ""
. ds C` ""
. ds C' ""
.br\}
.e\{\
. ds -- \\(em\}

```

```

. ds PI \(*p
. ds L" ``
. ds R" "
"br\}
.\"
.\" Escape single quotes in literal strings from groff's Unicode transform.
.ie \n(.g .ds Aq \{aq
.el .ds Aq '
.\"
.\" If the F register is turned on, we'll generate index entries on stderr for
.\" titles (.TH), headers (.SH), subsections (.SS), items (.Ip), and index
.\" entries marked with X<> in POD. Of course, you'll have to process the
.\" output yourself in some meaningful fashion.
.ie \nF \{\
. de IX
. tm Index:\$1\t\n%t"\$2"
..
. nr % 0
. rr F
.\}
.el \{\
. de IX
..
.\}
.\"
.\" Accent mark definitions (@(#)ms.acc 1.5 88/02/08 SMI; from UCB 4.2).
.\" Fear. Run. Save yourself. No user-serviceable parts.
. \" fudge factors for nroff and troff
.if n \{\
. ds #H 0
. ds #V .8m
. ds #F .3m
. ds #[ \f1
. ds #] \fP
.\}
.if t \{\
. ds #H ((1u-(\\n(.fu%2u)).13m)
. ds #V .6m
. ds #F 0
. ds #[ \&
. ds #] \&
.\}
. \" simple accents for nroff and troff
.if n \{\
. ds ' \&
. ds ` \&
. ds ^ \&
. ds , \&

```

```

. ds ~ ~
. ds /
.\}
.if t \{\
. ds '\k:h'-(\n(.wu*8/10-*(#H)^\h''\n:u'
. ds ` \k:h'-(\n(.wu*8/10-*(#H)^\h''\n:u'
. ds ^ \k:h'-(\n(.wu*10/11-*(#H)^\h''\n:u'
. ds , \k:h'-(\n(.wu*8/10)',h''\n:u'
. ds ~ \k:h'-(\n(.wu-*(#H-.1m)~\h''\n:u'
. ds / \k:h'-(\n(.wu*8/10-*(#H)\z(\sl'h''\n:u'
.\}
. \" troff and (daisy-wheel) nroff accents
.ds : \k:h'-(\n(.wu*8/10-*(#H+.1m+*(#F)\v'-*(#V)\z.h'.2m+*(#F'.h''\n:u'\v'*(#V'
.ds 8 \h''*(#H'(*b'h'-*(#H'
.ds o \k:h'-(\n(.wu+\w'(de'u-*(#H)/2u'\v'-.3n''*(#[z(\de\v'.3n'h''\n:u'*(#)
.ds d- \h''*(#H'(pd'h'-\w'~'u'\v'-.25m'\f2(\hy\fp\v'.25m'h'-*(#H'
.ds D- D\k:h'-\w'D'u'\v'-.11m'\z(\hy\v'.11m'h''\n:u'
.ds th \*(#[[v'.3m's+1I\s-1\v'-.3m'h'-(\w'I'u*2/3)\s-1o\s+1*(#]
.ds Th \*(#[[s+2I\s-2h'-\w'I'u*3/5'\v'-.3m'o\v'.3m'*(#]
.ds ae a'h'-(\w'a'u*4/10)'e
.ds Ae A'h'-(\w'A'u*4/10)'E
. \" corrections for vroff
.if v .ds ~ \k:h'-(\n(.wu*9/10-*(#H)\s-2\u~\d\s+2h''\n:u'
.if v .ds ^ \k:h'-(\n(.wu*10/11-*(#H)\v'-.4m'^\v'.4m'h''\n:u'
. \" for low resolution devices (crt and lpr)
.if \n(.H>23 .if \n(.V>19 \
\{\
. ds : e
. ds 8 ss
. ds o a
. ds d- d'h'-1'\(ga
. ds D- D'h'-1'\(hy
. ds th \o'bp'
. ds Th \o'LP'
. ds ae ae
. ds Ae AE
.\}
.rm #[ #] #H #V #F C
.\" =====
.\"
.IX Title "GPL 7"
.TH GPL 7 "2014-04-01" "gcc-4.8.3" "GNU"
.\" For nroff, turn off justification. Always turn off hyphenation; it makes
.\" way too many mistakes in technical documents.
.if n .ad l
.nh
.SH "NAME"
gpl \- GNU General Public License

```

```
.SH "DESCRIPTION"
.IX Header "DESCRIPTION"
.SS "\s-1GNU\s0 General Public License"
.IX Subsection "GNU General Public License"
.SS "Version 3, 29 June 2007"
.IX Subsection "Version 3, 29 June 2007"
.Vb 1
\&    Copyright (c) 2007 Free Software Foundation, Inc. <http://fsf.org/>
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.SS "Preamble"
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.PP

The precise terms and conditions for copying, distribution and modification follow.

.SS "\s-1TERMS\s0 \s-1AND\s0 \s-1CONDITIONS\s0"

.IX Subsection "TERMS AND CONDITIONS"

.IP "0. Definitions." 4

.IX Item "0. Definitions."

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.IP "1. Source Code." 4

.IX Item "1. Source Code."

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.Sp

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.Sp

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Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

.IP "3. Protecting Users' Legal Rights From Anti-Circumvention Law." 4

.IX Item "3. Protecting Users' Legal Rights From Anti-Circumvention Law."

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the [WIPO](#) copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

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When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with

respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

.IP "4. Conveying Verbatim Copies." 4

.IX Item "4. Conveying Verbatim Copies."

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

.Sp

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

.IP "5. Conveying Modified Source Versions." 4

.IX Item "5. Conveying Modified Source Versions."

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

.RS 4

.IP "a." 4

.IX Item "a."

The work must carry prominent notices stating that you modified it, and giving a relevant date.

.IP "b." 4

.IX Item "b."

The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to `\*(L"keep intact all notices\*(R"`.

.IP "c." 4

.IX Item "c."

You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

.IP "d." 4

.IX Item "d."

If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

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.RS 4

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A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an `&*(L"aggregate"*(R` if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

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.IP "6. Conveying Non-Source Forms." 4

.IX Item "6. Conveying Non-Source Forms."

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

.RS 4

.IP "a." 4

.IX Item "a."

Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

.IP "b." 4

.IX Item "b."

Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

.IP "c." 4

.IX Item "c."

Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

.IP "d." 4

.IX Item "d."

Convey the object code by offering access from a designated place

(gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

.IP "e." 4

.IX Item "e."

Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

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.RS 4

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A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

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A \\*(L"User Product\\*(R" is either (1) a \\*(L"consumer product\\*(R", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, \&\\*(L"normally used\\*(R" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

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\&\\*(L"Installation Information\\*(R" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

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If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as

part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in \s-1ROM\s0).

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The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

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Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

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.IP "7. Additional Terms." 4

.IX Item "7. Additional Terms."

\&\\*(L"Additional permissions\\*(R" are terms that supplement the terms of this License by making exceptions from one or more of its conditions.

Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

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.RS 4

.IP "a." 4

.IX Item "a."

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.IP "b." 4

.IX Item "b."

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.IP "c." 4

.IX Item "c."

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.IX Item "d."

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.IX Item "e."

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.IX Item "f."

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.RS 4

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If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

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Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.



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.IP "8. Termination." 4

.IX Item "8. Termination."

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.IP "9. Acceptance Not Required for Having Copies." 4

.IX Item "9. Acceptance Not Required for Having Copies."

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.IP "10. Automatic Licensing of Downstream Recipients." 4

.IX Item "10. Automatic Licensing of Downstream Recipients."

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.IP "11. Patents." 4

.IX Item "11. Patents."

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.IP "12. No Surrender of Others' Freedom." 4

.IX Item "12. No Surrender of Others' Freedom."

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.IX Item "13. Use with the GNU Affero General Public License."

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.IP "14. Revised Versions of this License." 4

.IX Item "14. Revised Versions of this License."

The Free Software Foundation may publish revised and/or new versions of the \s-1GNU\s0 General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

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.IP "15. Disclaimer of Warranty." 4

.IX Item "15. Disclaimer of Warranty."

\&\s-1THERE\s0 \s-1IS\s0 \s-1NO\s0 \s-1WARRANTY\s0 \s-1FOR\s0 \s-1THE\s0 \s-1PROGRAM\s0, \s-1TO\s0 \s-1THE\s0 \s-1EXTENT\s0 \s-1PERMITTED\s0 \s-1BY\s0

\&\s-1APPLICABLE\s0 \s-1LAW\s0. \s-1EXCEPT\s0 \s-1WHEN\s0 \s-1OTHERWISE\s0 \s-1STATED\s0 \s-1IN\s0 \s-1WRITING\s0 \s-1THE\s0 \s-1COPYRIGHT\s0

\&\s-1HOLDERS\s0 \s-1AND/OR\s0 \s-1OTHER\s0 \s-1PARTIES\s0 \s-1PROVIDE\s0 \s-1THE\s0 \s-1PROGRAM\s0 \\*(L"\s-1AS\s0 \s-1IS\s0\\*(R" \s-1WITHOUT\s0

\&\s-1WARRANTY\s0 \s-1OF\s0 \s-1ANY\s0 \s-1KIND\s0, \s-1EITHER\s0 \s-1EXPRESSED\s0 \s-1OR\s0 \s-1IMPLIED\s0, \s-1INCLUDING\s0, \s-1BUT\s0 \s-1NOT\s0

\&\s-1LIMITED\s0 \s-1TO\s0, \s-1THE\s0 \s-1IMPLIED\s0 \s-1WARRANTIES\s0 \s-1OF\s0 \s-1MERCHANTABILITY\s0 \s-1AND\s0 \s-1FITNESS\s0 \s-1FOR\s0

A \s-1PARTICULAR\s0 \s-1PURPOSE\s0. \s-1THE\s0 \s-1ENTIRE\s0 \s-1RISK\s0 \s-1AS\s0 \s-1TO\s0 \s-1THE\s0 \s-1QUALITY\s0 \s-1AND\s0

\&\s-1PERFORMANCE\s0 \s-1OF\s0 \s-1THE\s0 \s-1PROGRAM\s0 \s-1IS\s0 \s-1WITH\s0 \s-1YOU\s0. \s-

ISHOULD\s0 \s-1THE\s0 \s-1PROGRAM\s0 \s-1PROVE\s0  
 \&\s-1DEFECTIVE\s0, \s-1YOU\s0 \s-1ASSUME\s0 \s-1THE\s0 \s-1COST\s0 \s-1OF\s0 \s-1ALL\s0 \s-  
 1NECESSARY\s0 \s-1SERVICING\s0, \s-1REPAIR\s0 \s-1OR\s0  
 \&\s-1CORRECTION\s0.  
 .IP "16. Limitation of Liability." 4  
 .IX Item "16. Limitation of Liability."  
 \&\s-1IN\s0 \s-1NO\s0 \s-1EVENT\s0 \s-1UNLESS\s0 \s-1REQUIRED\s0 \s-1BY\s0 \s-1APPLICABLE\s0 \s-  
 1LAW\s0 \s-1OR\s0 \s-1AGREED\s0 \s-1TO\s0 \s-1IN\s0 \s-1WRITING\s0  
 \&\s-1WILL\s0 \s-1ANY\s0 \s-1COPYRIGHT\s0 \s-1HOLDER\s0, \s-1OR\s0 \s-1ANY\s0 \s-1OTHER\s0 \s-  
 1PARTY\s0 \s-1WHO\s0 \s-1MODIFIES\s0 \s-1AND/OR\s0  
 \&\s-1CONVEYS\s0 \s-1THE\s0 \s-1PROGRAM\s0 \s-1AS\s0 \s-1PERMITTED\s0 \s-1ABOVE\s0, \s-1BE\s0 \s-  
 1LIABLE\s0 \s-1TO\s0 \s-1YOU\s0 \s-1FOR\s0 \s-1DAMAGES\s0,  
 \&\s-1INCLUDING\s0 \s-1ANY\s0 \s-1GENERAL\s0, \s-1SPECIAL\s0, \s-1INCIDENTAL\s0 \s-1OR\s0 \s-  
 1CONSEQUENTIAL\s0 \s-1DAMAGES\s0  
 \&\s-1ARISING\s0 \s-1OUT\s0 \s-1OF\s0 \s-1THE\s0 \s-1USE\s0 \s-1OR\s0 \s-1INABILITY\s0 \s-1TO\s0 \s-  
 1USE\s0 \s-1THE\s0 \s-1PROGRAM\s0 (\s-1INCLUDING\s0 \s-1BUT\s0  
 \&\s-1NOT\s0 \s-1LIMITED\s0 \s-1TO\s0 \s-1LOSS\s0 \s-1OF\s0 \s-1DATA\s0 \s-1OR\s0 \s-1DATA\s0 \s-  
 1BEING\s0 \s-1RENDERED\s0 \s-1INACCURATE\s0 \s-1OR\s0  
 \&\s-1LOSSES\s0 \s-1SUSTAINED\s0 \s-1BY\s0 \s-1YOU\s0 \s-1OR\s0 \s-1THIRD\s0 \s-1PARTIES\s0 \s-1OR\s0  
 A \s-1FAILURE\s0 \s-1OF\s0 \s-1THE\s0 \s-1PROGRAM\s0  
 \&\s-1TO\s0 \s-1OPERATE\s0 \s-1WITH\s0 \s-1ANY\s0 \s-1OTHER\s0 \s-1PROGRAMS\s0), \s-1EVEN\s0 \s-  
 1IF\s0 \s-1SUCH\s0 \s-1HOLDER\s0 \s-1OR\s0 \s-1OTHER\s0  
 \&\s-1PARTY\s0 \s-1HAS\s0 \s-1BEEN\s0 \s-1ADVISED\s0 \s-1OF\s0 \s-1THE\s0 \s-1POSSIBILITY\s0 \s-  
 1OF\s0 \s-1SUCH\s0 \s-1DAMAGES\s0.

.IP "17. Interpretation of Sections 15 and 16." 4

.IX Item "17. Interpretation of Sections 15 and 16."

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.SS "\s-1END\s0 \s-1OF\s0 \s-1TERMS\s0 \s-1AND\s0 \s-1CONDITIONS\s0"

.IX Subsection "END OF TERMS AND CONDITIONS"

.SS "How to Apply These Terms to Your New Programs"

.IX Subsection "How to Apply These Terms to Your New Programs"

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the \\*(L"copyright\\*(R" line and a pointer to where the full notice is found.

.PP

.Vb 2

\& <one line to give the program\\*(Aqs name and a brief idea of what it does.>

```

\& Copyright (C) <year> <name of author>
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\& This program is free software: you can redistribute it and/or modify
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.PP
Also add information on how to contact you by electronic and paper mail.
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If the program does terminal interaction, make it output a short
notice like this when it starts in an interactive mode:
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program's commands might be different; for a \s-1GUI\s0 interface, you would
use an \*(L"about box\*(R".
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You should also get your employer (if you work as a programmer) or school,
if any, to sign a \*(L"copyright disclaimer\*(R" for the program, if necessary.
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@item

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@item

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@item

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@smallexample

@var{one line to give the program's name and a brief idea of what it does.}

Copyright (C) @var{year} @var{name of author}

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@end smallexample



Also add information on how to contact you by electronic and paper mail.

If the program does terminal interaction, make it output a short notice like this when it starts in an interactive mode:

```
@smallexample
@var{program} Copyright (C) @var{year} @var{name of author}
This program comes with ABSOLUTELY NO WARRANTY; for details type @samp{show w}.
This is free software, and you are welcome to redistribute it
under certain conditions; type @samp{show c} for details.
@end smallexample
```

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`@c man end`  
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This is an attempt to acknowledge early contributions to the garbage collector. Later contributions should instead be mentioned in README.changes.

## HISTORY -

Early versions of this collector were developed as a part of research projects supported in part by the National Science Foundation and the Defense Advance Research Projects Agency.

The garbage collector originated as part of the run-time system for the Russell programming language implementation. The first version of the garbage collector was written primarily by Al Demers. It was then refined and mostly rewritten, primarily by Hans-J. Boehm, at Cornell U., the University of Washington, Rice University (where it was first used for C and assembly code), Xerox PARC, SGI, and HP Labs. However, significant contributions have also been made by many others.

Some other contributors:

More recent contributors are mentioned in the modification history in README.changes. My apologies for any omissions.

The SPARC specific code was originally contributed by Mark Weiser.

The Encore Multimax modifications were supplied by

Kevin Kenny (kenny@m.cs.uiuc.edu). The adaptation to the IBM PC/RT is largely due to Vernon Lee, on machines made available to Rice by IBM.

Much of the HP specific code and a number of good suggestions for improving the generic code are due to Walter Underwood.

Robert Brazile (brazile@diamond.bbn.com) originally supplied the ULTRIX code.

Al Dosser (dosser@src.dec.com) and Regis Cridlig (Regis.Cridlig@cl.cam.ac.uk) subsequently provided updates and information on variation between ULTRIX systems. Parag Patel (parag@netcom.com) supplied the A/UX code.

Jesper Peterson(jep@mtiame.mtia.oz.au), Michel Schinz, and

Martin Tauchmann (martintauchmann@bigfoot.com) supplied the Amiga port.

Thomas Funke (thf@zelator.in-berlin.de(?)) and

Brian D.Carlstrom (bdc@clark.lcs.mit.edu) supplied the NeXT ports.

Douglas Steel (doug@wg.icl.co.uk) provided ICL DRS6000 code.

Bill Janssen (janssen@parc.xerox.com) supplied the SunOS dynamic loader

specific code. Manuel Serrano (serrano@cornas.inria.fr) supplied linux and Sony News specific code. Al Dosser provided Alpha/OSF/1 code. He and Dave Detlefs(detlefs@src.dec.com) also provided several generic bug fixes. Alistair G. Crooks(agg@uts.amdahl.com) supplied the NetBSD and 386BSD ports. Jeffrey Hsu (hsu@soda.berkeley.edu) provided the FreeBSD port. Brent Benson (brent@jade.ssd.csd.harris.com) ported the collector to a Motorola 88K processor running CX/UX (Harris NightHawk). Ari Huttunen (Ari.Huttunen@hut.fi) generalized the OS/2 port to nonIBM development environments (a nontrivial task). Patrick Beard (beard@cs.ucdavis.edu) provided the initial MacOS port. David Chase, then at Olivetti Research, suggested several improvements. Scott Schwartz (schwartz@groucho.cse.psu.edu) supplied some of the code to save and print call stacks for leak detection on a SPARC. Jesse Hull and John Ellis supplied the C++ interface code. Zhong Shao performed much of the experimentation that led to the current typed allocation facility. (His dynamic type inference code hasn't made it into the released version of the collector, yet.)  
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```
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#
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#
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# the Free Software Foundation; either version 3, or (at your option)
# any later version.
```

```

# This script adjusts the copyright notices at the top of source files
# so that they have the form:
#
# Copyright XXXX-YYYY Free Software Foundation, Inc.
#
# It doesn't change code that is known to be maintained elsewhere or
# that carries a non-FSF copyright.
#
# The script also doesn't change testsuite files, except those in
# libstdc++-v3. This is because libstdc++-v3 has a conformance testsuite,
# while most tests in other directories are just things that failed at some
# point in the past.
#
# Pass --this-year to the script if you want it to add the current year
# to all applicable notices. Pass --quilt if you are using quilt and
# want files to be added to the quilt before being changed.
#
# By default the script will update all directories for which the
# output has been vetted. You can instead pass the names of individual
# directories, including those that haven't been approved. So:
#
# update-copyright.pl --this-year
#
# is the command that would be used at the beginning of a year to update
# all copyright notices (and possibly at other times to check whether
# new files have been added with old years). On the other hand:
#
# update-copyright.pl --this-year libjava
#
# would run the script on just libjava/.
#
# Note that things like --version output strings must be updated before
# this script is run. There's already a separate procedure for that.

```

```

import os
import re
import sys
import time
import subprocess

```

```

class Errors:
    def __init__(self):
        self.num_errors = 0

    def report (self, filename, string):
        if filename:
            string = filename + ': ' + string

```

```

sys.stderr.write (string + '\n')
self.num_errors += 1

def ok (self):
    return self.num_errors == 0

class GenericFilter:
    def __init__ (self):
        self.skip_files = set()
        self.skip_dirs = set()
        self.skip_extensions = set()
        self.fossilised_files = set()
        self.own_files = set()

        self.skip_files |= set ([
            # Skip licence files.
            'COPYING',
            'COPYING.LIB',
            'COPYING3',
            'COPYING3.LIB',
            'LICENSE',
            'fdl.texi',
            'gpl_v3.texi',
            'fdl-1.3.xml',
            'gpl-3.0.xml',

            # Skip auto- and libtool-related files
            'aclocal.m4',
            'compile',
            'config.guess',
            'config.sub',
            'depcomp',
            'install-sh',
            'libtool.m4',
            'ltmain.sh',
            'ltoptions.m4',
            'ltsugar.m4',
            'ltversion.m4',
            'lt~obsolete.m4',
            'missing',
            'mkdep',
            'mkinstalldirs',
            'move-if-change',
            'shlibpath.m4',
            'symlink-tree',
            'ylwrap',

            # Skip FSF mission statement, etc.

```

```

'gnu.texi',
'funding.texi',
'appendix_free.xml',

# Skip imported texinfo files.
'texinfo.tex',
])

def get_line_filter (self, dir, filename):
    if filename.startswith ('ChangeLog'):
        # Ignore references to copyright in changelog entries.
        return re.compile ('\t')

    return None

def skip_file (self, dir, filename):
    if filename in self.skip_files:
        return True

    (base, extension) = os.path.splitext (os.path.join (dir, filename))
    if extension in self.skip_extensions:
        return True

    if extension == '.in':
        # Skip .in files produced by automake.
        if os.path.exists (base + '.am'):
            return True

        # Skip files produced by autogen
        if (os.path.exists (base + '.def')
            and os.path.exists (base + '.tpl')):
            return True

    # Skip configure files produced by autoconf
    if filename == 'configure':
        if os.path.exists (base + '.ac'):
            return True
        if os.path.exists (base + '.in'):
            return True

    return False

def skip_dir (self, dir, subdir):
    return subdir in self.skip_dirs

def is_fossilised_file (self, dir, filename):
    if filename in self.fossilised_files:

```

```

    return True
# Only touch current current ChangeLogs.
if filename != 'ChangeLog' and filename.find ('ChangeLog') >= 0:
    return True
return False

def by_package_author (self, dir, filename):
    return filename in self.own_files

class Copyright:
    def __init__ (self, errors):
        self.errors = errors

        # Characters in a range of years. Include '.' for typos.
        ranges = '[0-9](?:[-0-9.,\s]|\s+and\s+)*[0-9]'

        # Non-whitespace characters in a copyright holder's name.
        name = '[\w.,-]'

        # Matches one year.
        self.year_re = re.compile ('[0-9]+')

        # Matches part of a year or copyright holder.
        self.continuation_re = re.compile (ranges + '|' + name)

        # Matches a full copyright notice:
        self.copyright_re = re.compile (
            # 1: 'Copyright (C)', etc.
            '([Cc]opyright'
            '[Cc]opyright\s+\([Cc]\)'
            '[Cc]opyright\s+%s'
            '[Cc]opyright\s+&copy;'
            '[Cc]opyright\s+@copyright{ }'
            '@set\s+copyright[\w-]+)'

            # 2: the years. Include the whitespace in the year, so that
            # we can remove any excess.
            '\s*(?:' + ranges + ',?'
            '@value\{[^\{ }]*\})\s*')

            # 3: 'by ', if used
            '(by\s+)?'

            # 4: the copyright holder. Don't allow multiple consecutive
            # spaces, so that right-margin gloss doesn't get caught
            # (e.g. gnat_ugn.texti).
            '(' + name + '(?:\s?' + name + ')*?')

```

```

# A regexp for notices that might have slipped by. Just matching
# 'copyright' is too noisy, and 'copyright.*[0-9]' falls foul of
# HTML header markers, so check for 'copyright' and two digits.
self.other_copyright_re = re.compile ('copyright.*[0-9][0-9]',
                                       re.IGNORECASE)
self.comment_re = re.compile('#+|[*]+;+|%+|/+|@c |dnl ')
self.holders = { '@copying': '@copying' }
self.holder_prefixes = set()

# True to 'quilt add' files before changing them.
self.use_quilt = False

# If set, force all notices to include this year.
self.max_year = None

# Goes after the year(s). Could be ', '.
self.separator = ''

def add_package_author (self, holder, canon_form = None):
    if not canon_form:
        canon_form = holder
    self.holders[holder] = canon_form
    index = holder.find (' ')
    while index >= 0:
        self.holder_prefixes.add (holder[:index])
        index = holder.find (' ', index + 1)

def add_external_author (self, holder):
    self.holders[holder] = None

class BadYear():
    def __init__ (self, year):
        self.year = year

    def __str__ (self):
        return 'unrecognised year: ' + self.year

def parse_year (self, string):
    year = int (string)
    if len (string) == 2:
        if year > 70:
            return year + 1900
    elif len (string) == 4:
        return year
    raise self.BadYear (string)

def year_range (self, years):
    year_list = [self.parse_year (year)

```



```

        for year in self.year_re.findall (years)]
    assert len (year_list) > 0
    return (min (year_list), max (year_list))

def set_use_quilt (self, use_quilt):
    self.use_quilt = use_quilt

def include_year (self, year):
    assert not self.max_year
    self.max_year = year

def canonicalise_years (self, dir, filename, filter, years):
    # Leave texinfo variables alone.
    if years.startswith ('@value'):
        return years

    (min_year, max_year) = self.year_range (years)

    # Update the upper bound, if enabled.
    if self.max_year and not filter.is_fossilised_file (dir, filename):
        max_year = max (max_year, self.max_year)

    # Use a range.
    if min_year == max_year:
        return '%d' % min_year
    else:
        return '%d-%d' % (min_year, max_year)

def strip_continuation (self, line):
    line = line.lstrip()
    match = self.comment_re.match (line)
    if match:
        line = line[match.end():].lstrip()
    return line

def is_complete (self, match):
    holder = match.group (4)
    return (holder
            and (holder not in self.holder_prefixes
                or holder in self.holders))

def update_copyright (self, dir, filename, filter, file, line, match):
    orig_line = line
    next_line = None
    pathname = os.path.join (dir, filename)

    intro = match.group (1)
    if intro.startswith ('@set'):

```

```

# Texinfo year variables should always be on one line
after_years = line[match.end (2):].strip()
if after_years != "":
    self.errors.report (pathname,
                        'trailing characters in @set: '
                        + after_years)
    return (False, orig_line, next_line)
else:
    # If it looks like the copyright is incomplete, add the next line.
    while not self.is_complete (match):
        try:
            next_line = file.next()
        except StopIteration:
            break

        # If the next line doesn't look like a proper continuation,
        # assume that what we've got is complete.
        continuation = self.strip_continuation (next_line)
        if not self.continuation_re.match (continuation):
            break

        # Merge the lines for matching purposes.
        orig_line += next_line
        line = line.rstrip() + ' ' + continuation
        next_line = None

        # Rematch with the longer line, at the original position.
        match = self.copyright_re.match (line, match.start())
        assert match

holder = match.group (4)

# Use the filter to test cases where markup is getting in the way.
if filter.by_package_author (dir, filename):
    assert holder not in self.holders

elif not holder:
    self.errors.report (pathname, 'missing copyright holder')
    return (False, orig_line, next_line)

elif holder not in self.holders:
    self.errors.report (pathname,
                        'unrecognised copyright holder: ' + holder)
    return (False, orig_line, next_line)

else:
    # See whether the copyright is associated with the package
    # author.

```

```

    canon_form = self.holders[holder]
    if not canon_form:
        return (False, orig_line, next_line)

    # Make sure the author is given in a consistent way.
    line = (line[:match.start (4)]
           + canon_form
           + line[match.end (4):])

    # Remove any 'by'
    line = line[:match.start (3)] + line[match.end (3):]

# Update the copyright years.
years = match.group (2).strip()
try:
    canon_form = self.canonicalise_years (dir, filename, filter, years)
except self.BadYear as e:
    self.errors.report (pathname, str (e))
    return (False, orig_line, next_line)

line = (line[:match.start (2)]
       + ' ' + canon_form + self.separator
       + line[match.end (2):])

# Use the standard (C) form.
if intro.endswith ('right'):
    intro += ' (C)'
elif intro.endswith (('c')):
    intro = intro[:-3] + '(C)'
line = line[:match.start (1)] + intro + line[match.end (1):]

# Strip trailing whitespace
line = line.rstrip() + '\n'

return (line != orig_line, line, next_line)

def process_file (self, dir, filename, filter):
    pathname = os.path.join (dir, filename)
    if filename.endswith ('.tmp'):
        # Looks like something we tried to create before.
        try:
            os.remove (pathname)
        except OSError:
            pass
        return

    lines = []
    changed = False

```

```

line_filter = filter.get_line_filter (dir, filename)
with open (pathname, 'r') as file:
    prev = None
    for line in file:
        while line:
            next_line = None
            # Leave filtered-out lines alone.
            if not (line_filter and line_filter.match (line)):
                match = self.copyright_re.search (line)
                if match:
                    res = self.update_copyright (dir, filename, filter,
                                                file, line, match)
                    (this_changed, line, next_line) = res
                    changed = changed or this_changed

            # Check for copyright lines that might have slipped by.
            elif self.other_copyright_re.search (line):
                self.errors.report (pathname,
                                    'unrecognised copyright: %s'
                                    % line.strip())
            lines.append (line)
            line = next_line

# If something changed, write the new file out.
if changed and self.errors.ok():
    tmp_pathname = pathname + '.tmp'
    with open (tmp_pathname, 'w') as file:
        for line in lines:
            file.write (line)
    if self.use_quilt:
        subprocess.call (['quilt', 'add', pathname])
    os.rename (tmp_pathname, pathname)

def process_tree (self, tree, filter):
    for (dir, subdirs, filenames) in os.walk (tree):
        # Don't recurse through directories that should be skipped.
        for i in xrange (len (subdirs) - 1, -1, -1):
            if filter.skip_dir (dir, subdirs[i]):
                del subdirs[i]

        # Handle the files in this directory.
        for filename in filenames:
            if filter.skip_file (dir, filename):
                sys.stdout.write ('Skipping %s\n'
                                % os.path.join (dir, filename))
            else:
                self.process_file (dir, filename, filter)

```

```

class CmdLine:
    def __init__(self, copyright = Copyright):
        self.errors = Errors()
        self.copyright = copyright (self.errors)
        self.dirs = []
        self.default_dirs = []
        self.chosen_dirs = []
        self.option_handlers = dict()
        self.option_help = []

        self.add_option ('--help', 'Print this help', self.o_help)
        self.add_option ('--quilt', '"quilt add" files before changing them',
                        self.o_quilt)
        self.add_option ('--this-year', 'Add the current year to every notice',
                        self.o_this_year)

    def add_option (self, name, help, handler):
        self.option_help.append ((name, help))
        self.option_handlers[name] = handler

    def add_dir (self, dir, filter = GenericFilter()):
        self.dirs.append ((dir, filter))

    def o_help (self, option = None):
        sys.stdout.write ('Usage: %s [options] dir1 dir2...\n\n'
                          'Options:\n' % sys.argv[0])
        format = '%-15s %s\n'
        for (what, help) in self.option_help:
            sys.stdout.write (format % (what, help))
        sys.stdout.write ('\nDirectories:\n')

        format = '%-25s'
        i = 0
        for (dir, filter) in self.dirs:
            i += 1
            if i % 3 == 0 or i == len (self.dirs):
                sys.stdout.write (dir + '\n')
            else:
                sys.stdout.write (format % dir)
        sys.exit (0)

    def o_quilt (self, option):
        self.copyright.set_use_quilt (True)

    def o_this_year (self, option):
        self.copyright.include_year (time.localtime().tm_year)

    def main (self):

```

```

for arg in sys.argv[1:]:
    if arg[1] != '-':
        self.chosen_dirs.append (arg)
    elif arg in self.option_handlers:
        self.option_handlers[arg] (arg)
    else:
        self.errors.report (None, 'unrecognised option: ' + arg)
if self.errors.ok():
    if len (self.chosen_dirs) == 0:
        self.chosen_dirs = self.default_dirs
    if len (self.chosen_dirs) == 0:
        self.o_help()
    else:
        for chosen_dir in self.chosen_dirs:
            canon_dir = os.path.join (chosen_dir, "")
            count = 0
            for (dir, filter) in self.dirs:
                if (dir + os.sep).startswith (canon_dir):
                    count += 1
                    self.copyright.process_tree (dir, filter)
            if count == 0:
                self.errors.report (None, 'unrecognised directory: '
                                    + chosen_dir)
sys.exit (0 if self.errors.ok() else 1)

```

#-----

```

class TopLevelFilter (GenericFilter):
    def skip_dir (self, dir, subdir):
        return True

```

```

class ConfigFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

```

```

def skip_file (self, dir, filename):
    if filename.endswith ('.m4'):
        pathname = os.path.join (dir, filename)
        with open (pathname) as file:
            # Skip files imported from gettext.
            if file.readline().find ('gettext-') >= 0:
                return True
    return GenericFilter.skip_file (self, dir, filename)

```

```

class GCCFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

```

```

self.skip_files |= set ([
    # Not part of GCC
    'math-68881.h',
])

self.skip_dirs |= set ([
    # Better not create a merge nightmare for the GNAT folks.
    'ada',

    # Handled separately.
    'testsuite',
])

self.skip_extensions |= set ([
    # Maintained by the translation project.
    '.po',

    # Automatically-generated.
    '.pot',
])

self.fossilised_files |= set ([
    # Old news won't be updated.
    'ONEWS',
])

class TestsuiteFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

    self.skip_extensions |= set ([
        # Don't change the tests, which could be woened by anyone.
        '.c',
        '.C',
        '.cc',
        '.h',
        '.hs',
        '.f',
        '.f90',
        '.go',
        '.inc',
        '.java',
    ])

    def skip_file (self, dir, filename):
        # g++.niklas/README contains historical copyright information
        # and isn't updated.
        if filename == 'README' and os.path.basename (dir) == 'g++.niklas':

```

```

        return True
    return GenericFilter.skip_file (self, dir, filename)

class LibCppFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_extensions |= set ([
            # Maintained by the translation project.
            '.po',

            # Automatically-generated.
            '.pot',
        ])

class LibGCCFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_dirs |= set ([
            # Imported from GLIBC.
            'soft-fp',
        ])

class LibJavaFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_dirs |= set ([
            # Handled separately.
            'testsuite',

            # Not really part of the library
            'contrib',

            # Imported from upstream
            'classpath',
            'libltdl',
        ])

    def get_line_filter (self, dir, filename):
        if filename == 'NameDecoder.h':
            return re.compile ('.*NAME_COPYRIGHT')
        if filename == 'ICC_Profile.h':
            return re.compile ('.*icSigCopyrightTag')
        return GenericFilter.get_line_filter (self, dir, filename)

class LibMudflapFilter (GenericFilter):

```



```

def __init__(self):
    GenericFilter.__init__(self)

    self.skip_dirs |= set ([
        # Handled separately.
        'testsuite',
    ])

class LibStdCxxFilter (GenericFilter):
    def __init__(self):
        GenericFilter.__init__(self)

        self.skip_files |= set ([
            # Contains no copyright of its own, but quotes the GPL.
            'intro.xml',
        ])

        self.skip_dirs |= set ([
            # Contains automatically-generated sources.
            'html',

            # The testsuite data files shouldn't be changed.
            'data',

            # Contains imported images
            'images',
        ])

        self.own_files |= set ([
            # Contains markup around the copyright owner.
            'spine.xml',
        ])

    def get_line_filter (self, dir, filename):
        if filename == 'boost_concept_check.h':
            return re.compile ('// \\\(C\\) Copyright Jeremy Siek')
        return GenericFilter.get_line_filter (self, dir, filename)

class GCCCopyright (Copyright):
    def __init__(self, errors):
        Copyright.__init__(self, errors)

        canon_fsf = 'Free Software Foundation, Inc.'
        self.add_package_author ('Free Software Foundation', canon_fsf)
        self.add_package_author ('Free Software Foundation.', canon_fsf)
        self.add_package_author ('Free Software Foundation Inc.', canon_fsf)
        self.add_package_author ('Free Software Foundation, Inc', canon_fsf)
        self.add_package_author ('Free Software Foundation, Inc.', canon_fsf)

```

```

self.add_package_author ('The Free Software Foundation', canon_fsf)
self.add_package_author ('The Free Software Foundation, Inc.', canon_fsf)
self.add_package_author ('Software Foundation, Inc.', canon_fsf)

self.add_external_author ('ARM')
self.add_external_author ('AdaCore')
self.add_external_author ('Ami Tavory and Vladimir Dreizin, IBM-HRL.')
self.add_external_author ('Cavium Networks.')
self.add_external_author ('Faraday Technology Corp.')
self.add_external_author ('Florida State University')
self.add_external_author ('Greg Colvin and Beman Dawes.')
self.add_external_author ('Hewlett-Packard Company')
self.add_external_author ('Information Technology Industry Council.')
self.add_external_author ('James Theiler, Brian Gough')
self.add_external_author ('Makoto Matsumoto and Takuji Nishimura,')
self.add_external_author ('National Research Council of Canada.')
self.add_external_author ('Peter Dimov and Multi Media Ltd.')
self.add_external_author ('Peter Dimov')
self.add_external_author ('Pipeline Associates, Inc.')
self.add_external_author ('Regents of the University of California.')
self.add_external_author ('Silicon Graphics Computer Systems, Inc.')
self.add_external_author ('Silicon Graphics')
self.add_external_author ('Stephen L. Moshier')
self.add_external_author ('Sun Microsystems, Inc. All rights reserved.')
self.add_external_author ('The Go Authors. All rights reserved.')
self.add_external_author ('The Go Authors. All rights reserved.')
self.add_external_author ('The Go Authors.')
self.add_external_author ('The Regents of the University of California.')
self.add_external_author ('Unicode, Inc.')
self.add_external_author ('University of Toronto.')

```

```

class GCCCmdLine (CmdLine):
    def __init__ (self):
        CmdLine.__init__ (self, GCCCopyright)

        self.add_dir ('.', TopLevelFilter())
        # Boehm-gc is imported from upstream.
        self.add_dir ('config', ConfigFilter())
        # contrib isn't really part of GCC.
        self.add_dir ('fixincludes')
        self.add_dir ('gcc', GCCFilter())
        self.add_dir (os.path.join ('gcc', 'testsuite'), TestSuiteFilter())
        self.add_dir ('gnattools')
        self.add_dir ('include')
        self.add_dir ('libada')
        self.add_dir ('libatomic')
        self.add_dir ('libbacktrace')
        self.add_dir ('libcpp', LibCppFilter())

```

```

self.add_dir ('libdecnumber')
# libffi is imported from upstream.
self.add_dir ('libgcc', LibGCCFilter())
self.add_dir ('libgfortran')
self.add_dir ('libgomp')
self.add_dir ('libiberty')
self.add_dir ('libitm')
self.add_dir ('libjava', LibJavaFilter())
self.add_dir (os.path.join ('libjava', 'testsuite'), TestsuiteFilter())
self.add_dir ('libmudflap', LibMudflapFilter())
self.add_dir (os.path.join ('libmudflap', 'testsuite'),
               TestsuiteFilter())
self.add_dir ('libobjc')
self.add_dir ('libquadmath')
# libsanitiser is imported from upstream.
self.add_dir ('libssp')
self.add_dir ('libstdc++-v3', LibStdCxxFilter())
self.add_dir ('lto-plugin')
# zlib is imported from upstream.

```

```

self.default_dirs = [
    'gcc',
    'libada',
    'libatomic',
    'libbacktrace',
    'libcpp',
    'libdecnumber',
    'libgcc',
    'libgfortran',
    'libgomp',
    'libitm',
    'libmudflap',
    'libobjc',
    'libstdc++-v3',
]

```

GCCCmdLine().main()

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"><html
xmlns="http://www.w3.org/1999/xhtml"><head><meta http-equiv="Content-Type" content="text/html;
charset=UTF-8" /><title>License</title><meta name="generator" content="DocBook XSL-NS Stylesheets
V1.78.1" /><meta name="keywords" content="ISO C++, library" /><meta name="keywords" content="ISO C++,
runtime, library" /><link rel="home" href="../index.html" title="The GNU C++ Library" /><link rel="up"
href="status.html" title="Chapter1.Status" /><link rel="prev" href="status.html" title="Chapter1.Status" /><link
rel="next" href="bugs.html" title="Bugs" /></head><body><div class="navheader"><table width="100%"
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align="left"><a accesskey="p" href="status.html">Prev</a></td><th width="60%"

```

align="center">Chapter1.Status</th><td width="20%" align="right"><a accesskey="n" href="bugs.html">Next</a></td></tr></table><hr /></div><div class="section"><div class="titlepage"><div><div><h2 class="title" style="clear: both"><a id="manual.intro.status.license"></a>License</h2></div></div></div><p>

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<br />

Version3.1,31March2009<br />

<br />

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bearsanoticeplacedbythecopyrightholderofthefilestatingthat<br />

thefileisgovernedbyGPLv3alongwiththisException.<br />

<br />

WhenyouuseGCCtocompileaprogram,GCCmaycombineportionsof<br />

certainGCCheaderfilesandruntimelibrarieswiththecomplied<br />

program.ThepurposeofthisExceptionistoallowcompilationof<br />

non-GPL(includingproprietary)programstouse,inthisway,the<br />

headerfilesandruntimelibrariescoveredbythisException.<br />

<br />

0.Definitions.<br />

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Afileisan"IndependentModule"ifiteitherrequirestheRuntime<br />

LibraryforexecutionafteraCompilationProcess,ormakesuseofan<br />

interfaceprovidedbytheRuntimeLibrary,butisnototherwisebased<br />

ontheRuntimeLibrary.<br />

<br />

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The "Compilation Process" transforms code entirely represented in  
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preprocessors.

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<bridgehead xml:id="fdl-1-section1" renderas="sect2">

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</bridgehead>

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<bridgehead xml:id="fdl-1-section7" renderas="sect2">

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</appendix>

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<para>

Version 3, 29 June 2007

</para>

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<bridgehead xml:id="gpl-3-preamble" renderas="sect1">

Preamble

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<para>

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<bridgehead>

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<bridgehead xml:id="SourceCode" renderas="sect1">

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</bridgehead>

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</para>

<para>

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<para>

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<para>

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<para>

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<bridgehead xml:id="Protecting" renderas="sect1">

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<bridgehead xml:id="ConveyingVerbatim" renderas="sect1">

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<bridgehead xml:id="ConveyingModified" renderas="sect1">

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</para>

<orderedlist numeration="loweralpha" inheritnum="ignore" continuation="restarts">

<listitem>

<para>

The work must carry prominent notices stating that you modified it, and giving a relevant date.

</para>

</listitem>

<listitem>

<para>

The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to keep intact all notices.

</para>

</listitem>

<listitem>

<para>

You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

</para>

</listitem>

<listitem>

<para>

If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

</para>

</listitem>

</orderedlist>

<para>

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an aggregate if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

</para>

<bridgehead xml:id="ConveyingNonSource" renderas="sect1">

6. Conveying Non-Source Forms.

</bridgehead>

<para>

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

</para>

<orderedlist numeration="loweralpha" inheritnum="ignore" continuation="restarts">

<listitem>

<para>

Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

</para>

</listitem>



<listitem>

<para>

Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

</para>

</listitem>

<listitem>

<para>

Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

</para>

</listitem>

<listitem>

<para>

Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

</para>

</listitem>

<listitem>

<para>

Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

</para>

</listitem>

</orderedlist>

<para>

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

</para>

<para>

A User Product is either (1) a consumer product, which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, normally used refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

</para>

<para>

Installation Information for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

</para>

<para>

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in <acronym>ROM</acronym>).

</para>

<para>

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

</para>

<para>  
Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

</para>

<bridgehead xml:id="AdditionalTerms" renderas="sect1">

7. Additional Terms.

</bridgehead>

<para>

Additional permissions are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

</para>

<para>

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

</para>

<para>

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

</para>

<orderedlist numeration="loweralpha" inheritnum="ignore" continuation="restarts">

<listitem>

<para>

Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or

</para>

</listitem>

<listitem>

<para>

Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or

</para>

</listitem>

<listitem>

<para>

Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or

</para>

</listitem>

<listitem>

<para>

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</para>

</listitem>

<listitem>

<para>

Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

</para>

</listitem>

<listitem>

<para>

Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

</para>

</listitem>

</orderedlist>

<para>

All other non-permissive additional terms are considered further restrictions within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

</para>

<para>

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

</para>

<para>

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above

requirements apply either way.

</para>

<bridgehead xml:id="gpl-3-termination" renderas="sect1">

8. Termination.

</bridgehead>

<para>

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

</para>

<para>

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

</para>

<para>

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

</para>

<para>

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

</para>

<bridgehead xml:id="AcceptanceNotRequired" renderas="sect1">

9. Acceptance Not Required for Having Copies.

</bridgehead>

<para>

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

</para>

<bridgehead xml:id="AutomaticDownstream" renderas="sect1">

10. Automatic Licensing of Downstream Recipients.

</bridgehead>

<para>

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

</para>

<para>

An entity transaction is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

</para>

<para>

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</para>

<bridgehead xml:id="Patents" renderas="sect1">

11. Patents.

</bridgehead>

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</para>

<para>

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</para>

<para>

Each contributor grants you a non-exclusive, worldwide, royalty-free patent

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</para>

<para>

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</para>

<para>

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. Knowingly relying means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipients use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

</para>

<para>

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</para>

<para>

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</para>

<para>

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</para>

<bridgehead xml:id="NoSurrender" renderas="sect1">

12. No Surrender of Others Freedom.

</bridgehead>

<para>

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

</para>

<bridgehead xml:id="UsedWithAGPL" renderas="sect1">

13. Use with the <acronym>GNU</acronym> Affero General Public License.

</bridgehead>

<para>

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the <acronym>GNU</acronym> Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the <acronym>GNU</acronym> Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

</para>

<bridgehead xml:id="RevisedVersions" renderas="sect1">

14. Revised Versions of this License.

</bridgehead>

<para>

The Free Software Foundation may publish revised and/or new versions of the <acronym>GNU</acronym> General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

</para>

<para>

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numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the <acronym>GNU</acronym> General Public License, you may choose any version ever published by the Free Software Foundation.

</para>

<para>

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</para>

<para>

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

</para>

<bridgehead xml:id="WarrantyDisclaimer" renderas="sect1">

15. Disclaimer of Warranty.

</bridgehead>

<para>

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</para>

<bridgehead xml:id="LiabilityLimitation" renderas="sect1">

16. Limitation of Liability.

</bridgehead>

<para>

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</para>

<bridgehead xml:id="InterpretationSecs1516" renderas="sect1">

17. Interpretation of Sections 15 and 16.

</bridgehead>

<para>

If the disclaimer of warranty and limitation of liability provided above

cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

</para>

<bridgehead>

END OF TERMS AND CONDITIONS

</bridgehead>

<bridgehead xml:id="HowToApply" renderas="sect1">

How to Apply These Terms to Your New Programs

</bridgehead>

<para>

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

</para>

<para>

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the copyright line and a pointer to where the full notice is found.

</para>

<screen>

<replaceable>one line to give the programs name and a brief idea of what it does.</replaceable>  
Copyright (C) <replaceable>year</replaceable> <replaceable>name of author</replaceable>

This program is free software: you can redistribute it and/or modify it under the terms of the <acronym>GNU</acronym> General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the <acronym>GNU</acronym> General Public License for more details.

You should have received a copy of the <acronym>GNU</acronym> General Public License along with this program. If not, see <link xmlns:xlink="http://www.w3.org/1999/xlink" xlink:href="http://www.gnu.org/licenses/">http://www.gnu.org/licenses/</link>.

</screen>

<para>

Also add information on how to contact you by electronic and paper mail.

</para>

<para>

If the program does terminal interaction, make it output a short notice like this when it starts in an interactive mode:

</para>  
<screen>  
<replaceable>program</replaceable> Copyright (C) <replaceable>year</replaceable> <replaceable>name of author</replaceable>

This program comes with ABSOLUTELY NO WARRANTY; for details type <literal>show w</literal>. This is free software, and you are welcome to redistribute it under certain conditions; type <literal>show c</literal> for details.

</screen>

<para>  
The hypothetical commands <literal>show w</literal> and <literal>show c</literal> should show the appropriate parts of the General Public License. Of course, your programs commands might be different; for a GUI interface, you would use an about box.

</para>

<para>  
You should also get your employer (if you work as a programmer) or school, if any, to sign a copyright disclaimer for the program, if necessary. For more information on this, and how to apply and follow the <acronym>GNU</acronym> <acronym>GPL</acronym>, see <link xmlns:xlink="http://www.w3.org/1999/xlink" xlink:href="http://www.gnu.org/licenses/">http://www.gnu.org/licenses/</link>.

</para>

<para>  
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</para>

</appendix>

@node Library Copying

@appendixsec GNU LESSER GENERAL PUBLIC LICENSE

@cindex LGPL, Lesser General Public License

@center Version 2.1, February 1999

@display

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[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the

version number 2.1.]

@end display

@appendixsubsec Preamble

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For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

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For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

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linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

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, whereas the latter must be combined with the library in order to run.

@iftex

@appendixsubsec TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

@end iftex

@ifinfo

@center GNU LESSER GENERAL PUBLIC LICENSE

@center TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

@end ifinfo

@enumerate 0

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@item

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You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

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The modified work must itself be a software library.

@item

You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

@item

You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

@item

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.)

@end enumerate

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.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

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You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

@item

You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.



If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

@item

A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a ``work that uses the Library''. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

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.

@item

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.

You must give prominent notice with each copy of the work that the

Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable ``work that uses the Library'', as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

@item

Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

@item

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.

@item

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.

@item

Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

@end enumerate

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.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

@item

You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

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@item

Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

@item

Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

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@appendixsubsec How to Apply These Terms to Your New Libraries

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To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the ``copyright" line and a pointer to where the full notice is found.

@smallexample

@var{one line to give the library's name and an idea of what it does.}

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@end smallexample

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a ``copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

@smallexample

Yoyodyne, Inc., hereby disclaims all copyright interest in the library  
`Frob' (a library for tweaking knobs) written by James Random Hacker.

@var{signature of Ty Coon}, 1 April 1990

Ty Coon, President of Vice

@end smallexample

That's all there is to it!

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Version 2.1, February 1999

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When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General



Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

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, whereas the latter must be combined with the library in order to run.

^L

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A "library" means a collection of software functions and/or data

prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"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.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

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.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

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Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

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.

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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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a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

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.

e) Verify that the user has already received a copy of these

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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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```
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```

```
#ifndef __gnu_javax_sound_AudioSecurityManager$Permission__
#define __gnu_javax_sound_AudioSecurityManager$Permission__
```

```
#pragma interface
```

```
#include <java/lang/Enum.h>
#include <gcj/array.h>
```

```
extern "Java"
{
  namespace gnu
  {
    namespace javax
```

```

{
  namespace sound
  {
    class AudioSecurityManager$Permission;
  }
}
}
}

class gnu::javax::sound::AudioSecurityManager$Permission : public ::java::lang::Enum
{

  AudioSecurityManager$Permission(::java::lang::String *, jint);
public:
  static JArray< ::gnu::javax::sound::AudioSecurityManager$Permission * > * values();
  static ::gnu::javax::sound::AudioSecurityManager$Permission * valueOf(::java::lang::String *);
  static ::gnu::javax::sound::AudioSecurityManager$Permission * PLAY;
  static ::gnu::javax::sound::AudioSecurityManager$Permission * RECORD;
  static ::gnu::javax::sound::AudioSecurityManager$Permission * ALL;
private:
  static JArray< ::gnu::javax::sound::AudioSecurityManager$Permission * > * ENUM$VALUES;
public:
  static ::java::lang::Class class$;
};

#endif // __gnu_javax_sound_AudioSecurityManager$Permission__
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\* m4/ax\_func\_which\_gethostbyname\_r.m4

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```

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```
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```

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```
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```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

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```
16/gnu/javax/sound/AudioSecurityManager$Permissionjava/lang/EnumPLAY1Lgnu/javax/sound/AudioSecurityMa
nager$Permission;RECORDALLENUM$VALUES2[Lgnu/javax/sound/AudioSecurityManager$Permission;<clinit
>()VCode
<init>(Ljava/lang/String;I)V
LineNumberTableLocalVariableTable
thisvalues4()[Lgnu/javax/sound/AudioSecurityManager$Permission;
```

\$&%java/lang/System'  
arraycopy\*(Ljava/lang/Object;ILjava/lang/Object;II)VvalueOf(Ljava/lang/String;)Lgnu/javax/sound/AudioSecurityManager\$Permission;  
,)-5(Ljava/lang/Class;Ljava/lang/String;)Ljava/lang/Enum;  
SourceFileAudioSecurityManager.java  
SignatureCLjava/lang/Enum<Lgnu/javax/sound/AudioSecurityManager\$Permission;>;InnerClasses4\$gnu/javax/sound/AudioSecurityManager  
Permission@1@@@

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35@

1java/security/acl/Permissionjava/lang/Objectequals(Ljava/lang/Object;)ZtoString()Ljava/lang/String;

SourceFilePermission.java

1[java/security/Permissionjava/lang/Objectjava/security/Guardjava/io/SerializableserialVersionUIDJ

ConstantValue?(WQ~nameLjava/lang/String;<init>(Ljava/lang/String;)VCode

()V LineNumberTableLocalVariableTablethisLjava/security/Permission;

checkGuard(Ljava/lang/Object;)V

! java/lang/System"#getSecurityManager()Ljava/lang/SecurityManager;

% '&java/lang/SecurityManager()checkPermission(Ljava/security/Permission;)VobjLjava/lang/Object;smLjava/lang/SecurityManager;implies(Ljava/security/Permission;)Zequals(Ljava/lang/Object;)ZhashCode()IgetName()Ljava/lang/String;

getActionsnewPermissionCollection&(Ljava/security/PermissionCollection;toString;gnu/java/lang/CPStringBuilder

r

:

:>?@append"(C)Lgnu/java/lang/CPStringBuilder;

BCDgetClass()Ljava/lang/Class;

FHGjava/lang/Class45

:J?K3(Ljava/lang/String;)Lgnu/java/lang/CPStringBuilder;

H

N65P

RTSjava/lang/String01

:V95stringLgnu/java/lang/CPStringBuilder;

SourceFilePermission.java!

F

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q \*+

,./012345/\*6578,95S:Y<L+(=L+\*AEIL+ =L+\*LIL\*MOQ+ =L+\*MIL+)=L+U\*

" +7>GNSKWXYZ

/\* gnu.classpath.tools.taglets.CopyrightTaglet

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```
package gnu.classpath.tools.taglets;

import java.util.Map;

import com.sun.tools.doclets.Taglet;

import com.sun.javadoc.Tag;

/**
 * A simple Taglet which handles Copyright information.
 */
public class CopyrightTaglet implements Taglet {

    private static final String NAME = "copyright";
```

```

private static final String HEADER = "Copyright: ";

public String getName() {
    return NAME;
}

public boolean inField() {
    return true;
}

public boolean inConstructor() {
    return true;
}

public boolean inMethod() {
    return true;
}

public boolean inOverview() {
    return true;
}

public boolean inPackage() {
    return true;
}

public boolean inType() {
    return true;
}

public boolean isInlineTag() {
    return false;
}

public static void register(Map tagletMap) {
    CopyrightTaglet copyrightTaglet = new CopyrightTaglet();
    tagletMap.put(copyrightTaglet.getName(), copyrightTaglet);
}

public String toString(Tag tag) {
    return toString(new Tag[] { tag });
}

public String toString(Tag[] tags) {
    if (tags.length == 0) {
        return null;
    }
    else {

```

```

boolean haveValidTag = false;
for (int i = 0; i < tags.length && !haveValidTag; ++i) {
    if (tags[i].text().length() > 0) {
        haveValidTag = true;
    }
}

if (haveValidTag) {
    StringBuffer result = new StringBuffer();
    result.append("<dl>");
    for (int i = 0; i < tags.length; i++) {
        if (tags[i].text().length() > 0) {
            result.append("<dt><i>Copyright &#169; " + tags[i].text() + "</i></dt>");
        }
    }
    result.append("</dl>");
    return result.toString();
}
else {
    return null;
}
}
}
}

If+gnu/classpath/tools/taglets/CopyrightTagletjava/lang/Objectcom/sun/tools/doclets/TagletNAMELjava/lang/Strin
g;
ConstantValue copyrightHEADER
Copyright:<init>()VCode
LineNumberTableLocalVariableTablethis-
Lgnu/classpath/tools/taglets/CopyrightTaglet;getName()Ljava/lang/String;inField()Z
inConstructorinMethod
inOverview inPackageinTypeisInlineTagregister(Ljava/util/Map;)V

&(*)
java/util/Map+.put8(Ljava/lang/Object;Ljava/lang/Object;)Ljava/lang/Object;
tagletMapLjava/util/Map;copyrightTaglettoString)(Lcom/sun/javadoc/Tag;)Ljava/lang/String;3com/sun/javadoc/Ta
g
506*(Lcom/sun/javadoc/Tag;)Ljava/lang/String;tagLcom/sun/javadoc/Tag;2::text
=?>java/lang/String@Alength()ICjava/lang/StringBuffer
BF<dl>
BHIJappend,(Ljava/lang/String;)Ljava/lang/StringBuffer;Ljava/lang/StringBuilderN<dt><i>Copyright &#169;
KPQ(Ljava/lang/String;)V
KSIT-(Ljava/lang/String;)Ljava/lang/StringBuilder;V </i></dt>
KX0Z</dl>
BXtags[Lcom/sun/javadoc/Tag;haveValidTagZiresultLjava/lang/StringBuffer;
SourceFileCopyrightTaglet.java!

/*1-

```

```
7,;,?,C,G,K,O!,S "#QY$!*+%+'WWXY-.
```

```
/01A
```

```
*2Y+S4\
```

```
7806)+=>+29<=+_BYDN-EGW67+29<%-KYMO+29RURWGW+-YGW-[F`ad efge+k/17m>nDoSpunstw>] ^_  
`a7TbcA>`ade
```

```
/* Permission.java -- The superclass for all permission objects
```

```
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```

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```
package java.security;
```

```
import gnu.java.lang.CPStringBuilder;
```

```
import java.io.Serializable;
```

```

/**
 * This class is the abstract superclass of all classes that implement
 * the concept of a permission. A permission consists of a permission name
 * and optionally a list of actions that relate to the permission. The
 * actual meaning of the name of the permission is defined only in the
 * context of a subclass. It may name a resource to which access permissions
 * are granted (for example, the name of a file) or it might represent
 * something else entirely. Similarly, the action list only has meaning
 * within the context of a subclass. Some permission names may have no
 * actions associated with them. That is, you either have the permission
 * or you don't.
 *
 * <p>The most important method in this class is <code>implies</code>. This
 * checks whether if one has this permission, then the specified
 * permission is also implied. As a conceptual example, consider the
 * permissions "Read All Files" and "Read File foo". The permission
 * "Read All Files" implies that the caller has permission to read the
 * file foo.
 *
 * <p><code>Permission</code>'s must be immutable - do not change their
 * state after creation.
 *
 * @author Aaron M. Renn (arenn@urbanophile.com)
 * @see Permissions
 * @see PermissionCollection
 * @since 1.1
 * @status updated to 1.4
 */
public abstract class Permission implements Guard, Serializable
{
    /**
     * Compatible with JDK 1.1+.
     */
    private static final long serialVersionUID = -563657022231596674L;

    /**
     * This is the name assigned to this permission object.
     *
     * @serial the name of the permission
     */
    private String name;

    /**
     * Create an instance with the specified name.
     *
     * @param name the permission name
     */

```

```

public Permission(String name)
{
    this.name = name;
}

/**
 * This method implements the <code>Guard</code> interface for this class.
 * It calls the <code>checkPermission</code> method in
 * <code>SecurityManager</code> with this <code>Permission</code> as its
 * argument. This method returns silently if the security check succeeds
 * or throws an exception if it fails.
 *
 * @param obj the <code>Object</code> being guarded - ignored by this class
 * @throws SecurityException if the security check fails
 * @see GuardedObject
 * @see SecurityManager#checkPermission(Permission)
 */
public void checkGuard(Object obj)
{
    SecurityManager sm = System.getSecurityManager();
    if (sm != null)
        sm.checkPermission(this);
}

/**
 * This method tests whether this <code>Permission</code> implies that the
 * specified <code>Permission</code> is also granted.
 *
 * @param perm the <code>Permission</code> to test against
 * @return true if perm is implied by this
 */
public abstract boolean implies(Permission perm);

/**
 * Check to see if this object equals obj. Use <code>implies</code>, rather
 * than <code>equals</code>, when making access control decisions.
 *
 * @param obj the object to compare to
 */
public abstract boolean equals(Object obj);

/**
 * This method returns a hash code for this <code>Permission</code>. It
 * must satisfy the contract of <code>Object.hashCode</code>: it must be
 * the same for all objects that equals considers to be the same.
 *
 * @return a hash value
 */

```



```

public abstract int hashCode();

/**
 * Get the name of this Permission.
 *
 * @return the name
 */
public final String getName()
{
    return name;
}

/**
 * This method returns the list of actions for this Permission
 * as a String. The string should be in canonical order, for
 * example, both new FilePermission(f, "write,read") and
 * new FilePermission(f, "read,write") have the action list
 * "read,write".
 *
 * @return the action list for this Permission
 */
public abstract String getActions();

/**
 * This method returns an empty PermissionCollection object
 * that can store permissions of this type, or null if no
 * such collection is defined. Subclasses must override this to provide
 * an appropriate collection when one is needed to accurately calculate
 * implies.
 *
 * @return a new PermissionCollection
 */
public PermissionCollection newPermissionCollection()
{
    return null;
}

/**
 * This method returns a String representation of this
 * Permission object. This is in the format:
 * '( + getClass().getName() + ' + getName() + ' + getActions
 * + ').
 *
 * @return this object as a String
 */
public String toString()
{
    CPStringBuilder string = new CPStringBuilder();

```

```

string = string.append('(');
string = string.append(getClass().getName());
string = string.append(' ');
string = string.append(getName());

if (!(getActions().equals("")))
{
    string = string.append(' ');
    string = string.append(getActions());
}

string = string.append('');
return string.toString();
}
} // class Permission
/* Permission.java -- Information about an ACL permission
   Copyright (C) 1998 Free Software Foundation, Inc.

```

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```
package java.security.acl;
```

```
/**
```

```
* This interface provides information about a permission that can be  
* granted. Note that this is not the same as the class  
* java.security.Permission.
```

```
*
```

```
* @version 0.0
```

```
*
```

```
* @author Aaron M. Renn (arenn@urbanophile.com)
```

```
*/
```

```
public interface Permission
```

```
{
```

```
/**
```

```
* This method tests whether or not a specified Permission
```

```
* (passed as an Object) is the same as this permission.
```

```
*
```

```
* @param perm The permission to check for equality
```

```
*
```

```
* @return true if the specified permission is the same as this one, false otherwise
```

```
*/
```

```
boolean equals (Object perm);
```

```
/**
```

```
* This method returns this Permission as a String.
```

```
*
```

```
* @return A String representing this permission.
```

```
*/
```

```
String toString();
```

```
}
```

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```
// DO NOT EDIT THIS FILE - it is machine generated -*- c++ -*-
```

```
#ifndef __java_security_Permission__
#define __java_security_Permission__

#pragma interface

#include <java/lang/Object.h>
extern "Java"
{
  namespace java
  {
    namespace security
    {
      class Permission;
      class PermissionCollection;
    }
  }
}

class java::security::Permission : public ::java::lang::Object
{
public:
  Permission(::java::lang::String *);
  virtual void checkGuard(::java::lang::Object *);
  virtual jboolean implies(::java::security::Permission *) = 0;
  virtual jboolean equals(::java::lang::Object *) = 0;
  virtual jint hashCode() = 0;
  virtual ::java::lang::String * getName();
}
```

```

virtual ::java::lang::String * getActions() = 0;
virtual ::java::security::PermissionCollection * newPermissionCollection();
virtual ::java::lang::String * toString();
private:
static const jlong serialVersionUID = -5636570222231596674LL;
::java::lang::String * __attribute__((aligned(__alignof__( ::java::lang::Object)))) name;
public:
static ::java::lang::Class class$;
};

#endif // __java_security_Permission__

// DO NOT EDIT THIS FILE - it is machine generated -*- c++ -*-

#ifndef __java_security_acl_Permission__
#define __java_security_acl_Permission__

#pragma interface

#include <java/lang/Object.h>
extern "Java"
{
namespace java
{
namespace security
{
namespace acl
{
class Permission;
}
}
}
}

class java::security::acl::Permission : public ::java::lang::Object
{
public:
virtual jboolean equals(::java::lang::Object *) = 0;
virtual ::java::lang::String * toString() = 0;
static ::java::lang::Class class$;
} __attribute__((java_interface));

#endif // __java_security_acl_Permission__

```

# 1.19 libssh 0.7.6

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**cb**

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```
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```

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```
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```

<signature of Ty Coon>, 1 April 1989

Ty Coon, President of Vice

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Initialize empty image

f1c9645dbc14efddc7d8a322685f26eb bsd.img

Create new DOS partition table

57e721e38d1266c2df055067c18f2cf9 bsd.img

---layout-----

Disk <removed>: 10 MiB, 10485760 bytes, 20480 sectors

Units: sectors of 1 \* 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disklabel type: dos

Disk identifier: <removed>

-----

Create 1st primary partition

ada64ace122978d00d1d1c0e5ee45d26 bsd.img

---layout-----

Disk <removed>: 10 MiB, 10485760 bytes, 20480 sectors

Units: sectors of 1 \* 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disklabel type: dos

Disk identifier: <removed>

Device	Boot	Start	End	Sectors	Size	Id	Type
--------	------	-------	-----	---------	------	----	------

<removed>1		2048	4095	2048	1M	83	Linux
------------	--	------	------	------	----	----	-------

-----

Create 2st primary partition

1bebf87248e05d6e4e62b749da65d023 bsd.img

Set 2nd partition type

2d8e8dff51a88a045db233418dd73fbe bsd.img

---layout-----

Disk <removed>: 10 MiB, 10485760 bytes, 20480 sectors

Units: sectors of 1 \* 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disklabel type: dos  
Disk identifier: <removed>

Device	Boot	Start	End	Sectors	Size	Id	Type
<removed>1		2048	4095	2048	1M	83	Linux
<removed>2		4096	20479	16384	8M	a5	FreeBSD

-----

Create default BSD  
2e1cee529cb59c9341afef0443f196a1 bsd.img

---layout-----

Welcome to fdisk <removed>.  
Changes will remain in memory only, until you decide to write them.  
Be careful before using the write command.

Command (m for help): Entering nested BSD disklabel.

Command (m for help): Disk <removed>2: 10 MiB, 10485760 bytes, 20480 sectors  
Geometry: 255 heads, 63 sectors/track, 1 cylinders  
Units: sectors of 1 \* 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disklabel type: bsd  
partitions: 4

Slice	Start	End	Sectors	Size	Type	Fsize	Bsize	Cpg
c	4096	20479	16384	8M	unused	0	0	0
d	0	16064	16065	7.9M	unused	0	0	0

Partition table entries are not in disk order.

Command (m for help): Leaving nested disklabel.

Command (m for help):

-----

b5c121c2091b2ff26b880551feac7112 bsd.img

---layout-----

Welcome to fdisk <removed>.  
Changes will remain in memory only, until you decide to write them.  
Be careful before using the write command.

Command (m for help): Entering nested BSD disklabel.

Command (m for help): Disk <removed>2: 10 MiB, 10485760 bytes, 20480 sectors

Geometry: 255 heads, 63 sectors/track, 1 cylinders

Units: sectors of 1 \* 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disklabel type: bsd

partitions: 4

Slice	Start	End	Sectors	Size	Type	Fsize	Bsize	Cpg
a	4096	6144	2049	1M	4.2BSD	0	0	0
c	4096	20479	16384	8M	unused	0	0	0
d	0	16064	16065	7.9M	unused	0	0	0

Partition table entries are not in disk order.

Command (m for help): Leaving nested disklabel.

Command (m for help):

-----

Changes will remain in memory only, until you decide to write them.

Be careful before using the write command.

Command (m for help): Entering nested BSD disklabel.

Command (m for help):

0	unused	5	4.1BSD	9	4.4LFS	d	boot
1	swap	6	Eighth Edition	a	unknown	e	ADOS
2	Version 6	7	4.2BSD	b	HPFS	f	HFS
3	Version 7	8	MS-DOS	c	ISO-9660	10	AdvFS
4	System V						

Command (m for help):

/\*

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- test-server/\*.c
- test-server/\*.h
- lwsws/\*

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# 1.24 libxml2 2.9.8

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# 1.25 linux 3.10.70 :2015\_T1.1p10

## 1.25.1 Available under license :

```
/*
 * ahci_mv.c - Marvell AHCI SATA platform support
 *
 * Copyright 2013: Marvell Corporation, all rights reserved.
 *
 * based on the AHCI SATA platform driver by Jeff Garzik and Anton Vorontsov
 *
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\*/

```
#include <linux/kernel.h>
#include <linux/gfp.h>
#include <linux/module.h>
#include <linux/pm.h>
#include <linux/init.h>
#include <linux/interrupt.h>
#include <linux/device.h>
#include <linux/platform_device.h>
#include <linux/libata.h>
#include <linux/ahci_platform.h>
#include <linux/ata_platform.h>
#include <linux/mbus.h>
#include "ahci.h"

#define AHCI_WINDOW_CTRL(win) (0x60 + ((win) << 4))
#define AHCI_WINDOW_BASE(win) (0x64 + ((win) << 4))
#define AHCI_WINDOW_SIZE(win) (0x68 + ((win) << 4))

#define VENDOR_SPECIFIC_0_ADDR 0xa0
#define VENDOR_SPECIFIC_0_DATA 0xa4

static void ahci_mv_windows_config(struct ahci_host_priv *hpriv,
    const struct mbus_dram_target_info *dram)
{
    int i;

    for (i = 0; i < 4; i++) {
        writel(0, hpriv->mmio + AHCI_WINDOW_CTRL(i));
        writel(0, hpriv->mmio + AHCI_WINDOW_BASE(i));
        writel(0, hpriv->mmio + AHCI_WINDOW_SIZE(i));
    }

    for (i = 0; i < dram->num_cs; i++) {
        const struct mbus_dram_window *cs = dram->cs + i;

        writel((cs->mbus_attr << 8) |
            (dram->mbus_dram_target_id << 4) | 1,
            hpriv->mmio + AHCI_WINDOW_CTRL(i));
        writel(cs->base >> 16, hpriv->mmio + AHCI_WINDOW_BASE(i));
        writel(((cs->size - 1) & 0xffff0000),
            hpriv->mmio + AHCI_WINDOW_SIZE(i));
    }
}
```

```

}

static void ahci_mv_host_stop(struct ata_host *host);

static struct ata_port_operations ahci_mv_ops = {
    .inherits = &ahci_ops,
    .host_stop = ahci_mv_host_stop,
};

static const struct ata_port_info ahci_mv_port_info = {
    .flags = AHCI_FLAG_COMMON,
    .pio_mask = ATA_PIO4,
    .udma_mask = ATA_UDMA6,
    .port_ops = &ahci_mv_ops,
};

static struct scsi_host_template ahci_mv_platform_sht = {
    AHCI_SHT("ahci_mv_platform"),
};

static const struct of_device_id ahci_mv_of_match[] = {
    { .compatible = "marvell,ahci-sata", },
    {},
};

MODULE_DEVICE_TABLE(of, ahci_mv_of_match);

static int ahci_mv_probe(struct platform_device *pdev)
{
    struct device *dev = &pdev->dev;
    const struct mbus_dram_target_info *dram;
    struct ata_port_info pi = ahci_mv_port_info;
    const struct ata_port_info *ppi[] = { &pi, NULL };
    struct ahci_host_priv *hpriv;
    struct ata_host *host;
    struct resource *mem;
    int irq;
    int n_ports;
    int i;
    int rc;

    mem = platform_get_resource(pdev, IORESOURCE_MEM, 0);
    if (!mem) {
        dev_err(dev, "no mmio space\n");
        return -EINVAL;
    }

    irq = platform_get_irq(pdev, 0);
    if (irq <= 0) {

```

```

dev_err(dev, "no irq\n");
return -EINVAL;
}

hpriv = devm_kzalloc(dev, sizeof(*hpriv), GFP_KERNEL);
if (!hpriv) {
dev_err(dev, "can't alloc ahci_host_priv\n");
return -ENOMEM;
}

hpriv->clk = devm_clk_get(&pdev->dev, NULL);
if (IS_ERR(hpriv->clk)) {
dev_err(dev, "can't get clock\n");
return PTR_ERR(hpriv->clk);
}

rc = clk_prepare_enable(hpriv->clk);
if (rc < 0) {
dev_err(dev, "can't enable clock\n");
return rc;
}

hpriv->flags |= (unsigned long)pi.private_data;

hpriv->mmio = devm_request_and_ioremap(dev, mem);
if (!hpriv->mmio) {
dev_err(dev, "can't map %pR\n", mem);
clk_disable_unprepare(hpriv->clk);
return -ENOMEM;
}

/*
 * (Re-)program MBUS remapping windows if we are asked to.
 */
dram = mv_mbus_dram_info();
if (dram)
ahci_mv_windows_config(hpriv, dram);

ahci_save_initial_config(dev, hpriv, 0, 0);

/* prepare host */
if (hpriv->cap & HOST_CAP_NCQ)
pi.flags |= ATA_FLAG_NCQ;

if (hpriv->cap & HOST_CAP_PMP)
pi.flags |= ATA_FLAG_PMP;

ahci_set_em_messages(hpriv, &pi);

```

```

/*
 * CAP.NP sometimes indicate the index of the last enabled
 * port, at other times, that of the last possible port, so
 * determining the maximum port number requires looking at
 * both CAP.NP and port_map.
 */
n_ports = max(ahci_nr_ports(hpriv->cap), fls(hpriv->port_map));

host = ata_host_alloc_pinfo(dev, ppi, n_ports);
if (!host) {
    clk_disable_unprepare(hpriv->clk);
    return -ENOMEM;
}

host->private_data = hpriv;

if (!(hpriv->cap & HOST_CAP_SSS) || ahci_ignore_sss)
    host->flags |= ATA_HOST_PARALLEL_SCAN;
else
    printk(KERN_INFO "ahci: SSS flag set, parallel bus scan disabled\n");

if (pi.flags & ATA_FLAG_EM)
    ahci_reset_em(host);

for (i = 0; i < host->n_ports; i++) {
    struct ata_port *ap = host->ports[i];

    ata_port_desc(ap, "mmio %pR", mem);
    ata_port_desc(ap, "port 0x%x", 0x100 + ap->port_no * 0x80);

    /* set enclosure management message type */
    if (ap->flags & ATA_FLAG_EM)
        ap->em_message_type = hpriv->em_msg_type;

    /* disabled/not-implemented port */
    if (!(hpriv->port_map & (1 << i)))
        ap->ops = &ata_dummy_port_ops;
}

/* Enabling regret bit to enables the SATA unit to regret
a request that didn't receive an acknowledge and avoid a deadlock */

writel(0x4, hpriv->mmio + VENDOR_SPECIFIC_0_ADDR);
writel(0x80, hpriv->mmio + VENDOR_SPECIFIC_0_DATA);

rc = ahci_reset_controller(host);
if (rc) {

```



```

clk_disable_unprepare(hpriv->clk);
return rc;
}

ahci_init_controller(host);
ahci_print_info(host, "platform");

rc = ata_host_activate(host, irq, ahci_interrupt, IRQF_SHARED,
    &ahci_mv_platform_sht);
if (rc) {
    clk_disable_unprepare(hpriv->clk);
    return rc;
}

return 0;
}

static void ahci_mv_host_stop(struct ata_host *host)
{
    struct ahci_host_priv *hpriv = host->private_data;
    clk_disable_unprepare(hpriv->clk);
}

#ifdef CONFIG_PM_SLEEP
static int ahci_mv_suspend(struct device *dev)
{
    struct ata_host *host = dev_get_drvdata(dev);
    struct ahci_host_priv *hpriv = host->private_data;
    void __iomem *mmio = hpriv->mmio;
    u32 ctl;
    int rc;

    if (hpriv->flags & AHCI_HFLAG_NO_SUSPEND) {
        dev_err(dev, "firmware update required for suspend/resume\n");
        return -EIO;
    }

    /*
     * AHCI spec rev1.1 section 8.3.3:
     * Software must disable interrupts prior to requesting a
     * transition of the HBA to D3 state.
     */
    ctl = readl(mmio + HOST_CTL);
    ctl &= ~HOST_IRQ_EN;
    writel(ctl, mmio + HOST_CTL);
    readl(mmio + HOST_CTL); /* flush */

    rc = ata_host_suspend(host, PMSG_SUSPEND);

```

```

if (rc)
    return rc;

return 0;
}

static int ahci_mv_resume(struct device *dev)
{
    struct ata_host *host = dev_get_drvdata(dev);
    struct ahci_host_priv *hpriv = host->private_data;
    const struct mbus_dram_target_info *dram;
    int rc;

    dram = mv_mbus_dram_info();
    if (dram)
        ahci_mv_windows_config(hpriv, dram);

    if (dev->power.power_state.event == PM_EVENT_SUSPEND) {
        rc = ahci_reset_controller(host);
        if (rc)
            return rc;

        ahci_init_controller(host);
    }

    ata_host_resume(host);

    return 0;
}
#endif

static SIMPLE_DEV_PM_OPS(ahci_mv_pm_ops, ahci_mv_suspend, ahci_mv_resume);

static struct platform_driver ahci_mv_driver = {
    .probe = ahci_mv_probe,
    .remove = ata_platform_remove_one,
    .driver = {
        .name = "ahci_mv",
        .owner = THIS_MODULE,
        .of_match_table = ahci_mv_of_match,
        .pm = &ahci_mv_pm_ops,
    },
};

module_platform_driver(ahci_mv_driver);

MODULE_DESCRIPTION("Marvell AHCI SATA platform driver");
MODULE_AUTHOR("Marcin Wojtas <mw@semihalf.com>");

```

```
MODULE_LICENSE("GPL");  
MODULE_ALIAS("platform:ahci_mv");
```

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## THE BASIC LIBRARY FUNCTIONS

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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.

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- b) 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.
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On all platforms, Nmap is normally linked with:

o libpcap: Network packet capture library. Distributed with Nmap in the libpcap subdirectory.

<http://www.tcpdump.org/>

o libdnet: Networking library, used for low-level tasks such as sending ethernet frames. A modified version is distributed with Nmap in the libdnet-stripped subdirectory. A summary of Nmap-local modifications is in the file NMAP\_MODIFICATIONS.

<http://code.google.com/p/libdnet/>

- o PCRE: Perl-compatible regular expressions. PCRE is part of Nmap's version detection and is also made available as an NSE library. Distributed with Nmap in the libpcre subdirectory.  
<http://www.pcre.org/>
- o liblua: Lua programming language. Lua is the implementation language of NSE, the Nmap Scripting Engine. Nmap links with liblua to allow running Lua programs inside Nmap. Distributed with Nmap in the liblua subdirectory. liblua can be omitted by configuring with the `--without-liblua` configuration directive.  
<http://www.lua.org/>
- o OpenSSL: Cryptographic library. OpenSSL is used by service detection and by NSE to connect to SSL services. NSE also provides access to OpenSSL functions such as encryption and digest calculation. OpenSSL can be disabled by configuring with the `--without-openssl` configuration directive.  
<http://www.openssl.org/>
- o LIBLINEAR. Used for IPv6 OS classification.  
<http://www.csie.ntu.edu.tw/~cjlin/liblinear/>
- o libsvn. The Subversion library, used by the updater program `nmap-update`. <http://subversion.apache.org/>
- o APR (Apache Portable Runtime). Used by libsvn. <http://apr.apache.org/>

On Windows only, Nmap uses:

- o WinPcap: libpcap for Windows. The libpcap license applies to WinPcap, and it also has its own license. A binary copy of the library is distributed with Nmap in the subdirectory `m32/winpcap`.  
<http://www.winpcap.org/>

Certain Nmap Scripting Engine scripts use the simplified BSD license in `licenses/BSD-simplified`.

Zenmap and Ndiff require:

- o Python. The binary distributions of Nmap include a Python interpreter and various libraries, built using either `py2exe` or `py2app`.  
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The Windows and Mac OS X binary packages include bundled versions of:

- o GLib, GTK+, ATK, Pango: These libraries are licensed under the GNU LGPL 2, a copy of which is in the file `licenses/LGPL-2`.  
<http://www.gtk.org/>
- o Cairo: graphics library. Dual-licensed under the GNU LGPL 2.1 and the MPL 1.1. See the files `licenses/LGPL-2.1` and `licenses/MPL-1.1`.  
<http://www.cairographics.org/>
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- o libpng, jpeg, LibTIFF: Image file format libraries used by GTK+.  
<http://www.libpng.org/> <http://www.ijg.org/> <http://www.libtiff.org/>
- o zlib and bzip2: compression libraries.  
<http://www.zlib.org/> <http://www.bzip.org/>

- o Expat: XML parser library.  
<http://expat.sourceforge.net/>
- o fontconfig: font configuration library.  
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- o FreeType: font rendering library.  
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- o PyGTK, PyGObject: bindings for Python. Licensed under the GNU LGPL 2.1.  
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The Mac OS binary packages also include:

- o Various X.org libraries. These were built using MacPorts.  
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## THE BASIC LIBRARY FUNCTIONS

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Written by: Philip Hazel  
Email local part: ph10  
Email domain: cam.ac.uk

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Written by: Philip Hazel

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```

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```

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```

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```

```
*
```

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\*

\* @(#)glob.c 8.3 (Berkeley) 10/13/93

\*/

/\*

\* glob(3) -- a superset of the one defined in POSIX 1003.2.

\*

\* The [!...] convention to negate a range is supported (SysV, Posix, ksh).

\*

\* Optional extra services, controlled by flags not defined by POSIX:

\*

\* GLOB\_MAGCHAR:

\* Set in gl\_flags if pattern contained a globbing character.

\* GLOB\_TILDE:

\* expand ~user/foo to the /home/dir/of/user/foo

\* GLOB\_BRACE:

\* expand {1,2}{a,b} to 1a 1b 2a 2b

\* gl\_matchc:

\* Number of matches in the current invocation of glob.

\*/

#include <config.h>

#ifndef HAVE\_GLOB

#include <sys/types.h>

#include <sys/stat.h>

#include <stdio.h>

#include <stdlib.h>

#ifdef HAVE\_STRING\_H

# include <string.h>

#endif /\* HAVE\_STRING\_H \*/

#ifdef HAVE\_STRINGS\_H

# include <strings.h>

#endif /\* HAVE\_STRINGS\_H \*/

#include <unistd.h>

#if defined(HAVE\_STDINT\_H)

# include <stdint.h>



```

#elif defined(HAVE_INTTYPES_H)
#include <inttypes.h>
#endif
#include <ctype.h>
#include <dirent.h>
#include <errno.h>
#include <limits.h>
#include <pwd.h>

#include "sudo_compat.h"
#include "compat/glob.h"
#include "compat/charclass.h"

#define DOLLAR '$'
#define DOT '.'
#define EOS '\0'
#define LBRACKET '['
#define NOT '!'
#define QUESTION '?'
#define QUOTE '\\"
#define RANGE '-'
#define RBRACKET ']'
#define SEP '/'
#define STAR '*'
#define TILDE '~'
#define UNDERSCORE '_'
#define LBRACE '{'
#define RBRACE '}'
#define SLASH '/'
#define COMMA ','

#ifndef DEBUG

#define M_QUOTE 0x8000
#define M_PROTECT 0x4000
#define M_MASK 0xffff
#define M_ASCII 0x00ff

typedef unsigned short Char;

#else

#define M_QUOTE 0x80
#define M_PROTECT 0x40
#define M_MASK 0xff
#define M_ASCII 0x7f

typedef char Char;

```

```

#endif

#define CHAR(c) ((Char)((c)&M_ASCII))
#define META(c) ((Char)((c)|M_QUOTE))
#define M_ALL META('*')
#define M_END META(']')
#define M_NOT META('!')
#define M_ONE META('?')
#define M_RNG META('-')
#define M_SET META('[')
#define M_CLASS META(':')
#define ismeta(c) (((c)&M_QUOTE) != 0)

#define GLOB_LIMIT_MALLOC 65536
#define GLOB_LIMIT_STAT 2048
#define GLOB_LIMIT_READDIR 16384

/* Limit of recursion during matching attempts. */
#define GLOB_LIMIT_RECUR 64

struct glob_lim {
    size_t glim_malloc;
    size_t glim_stat;
    size_t glim_readdir;
};

static int compare(const void *, const void *);
static int g_Ctoc(const Char *, char *, unsigned int);
static int g_lstat(Char *, struct stat *, glob_t *);
static DIR *g_opendir(Char *, glob_t *);
static Char *g_strchr(const Char *, int);
static int g_strncmp(const Char *, const char *, size_t);
static int g_stat(Char *, struct stat *, glob_t *);
static int glob0(const Char *, glob_t *, struct glob_lim *);
static int glob1(Char *, Char *, glob_t *, struct glob_lim *);
static int glob2(Char *, Char *, Char *, Char *, Char *, Char *,
    glob_t *, struct glob_lim *);
static int glob3(Char *, Char *, Char *, Char *, Char *,
    Char *, Char *, glob_t *, struct glob_lim *);
static int globextend(const Char *, glob_t *, struct glob_lim *,
    struct stat *);
static const Char *
    globtilde(const Char *, Char *, size_t, glob_t *);
static int globexp1(const Char *, glob_t *, struct glob_lim *);
static int globexp2(const Char *, const Char *, glob_t *,
    struct glob_lim *);

```

```

static int match(Char *, Char *, Char *, int);
#ifdef DEBUG
static void qprintf(const char *, Char *);
#endif

int
sudo_glob(const char *pattern, int flags, int (*errfunc)(const char *, int),
          glob_t *pglob)
{
    const unsigned char *patnext;
    int c;
    Char *bufnext, *bufend, patbuf[PATH_MAX];
    struct glob_lim limit = { 0, 0, 0 };

    patnext = (unsigned char *) pattern;
    if (!(flags & GLOB_APPEND)) {
        pglob->gl_pathc = 0;
        pglob->gl_pathv = NULL;
        if (!(flags & GLOB_DOOFFS))
            pglob->gl_offs = 0;
    }
    pglob->gl_flags = flags & ~GLOB_MAGCHAR;
    pglob->gl_errfunc = errfunc;
    pglob->gl_matchc = 0;

    if (pglob->gl_offs < 0 || pglob->gl_pathc < 0 ||
        pglob->gl_offs >= INT_MAX || pglob->gl_pathc >= INT_MAX ||
        pglob->gl_pathc >= INT_MAX - pglob->gl_offs - 1)
        return GLOB_NOSPACE;

    if (strlen(pattern, PATH_MAX) == PATH_MAX)
        return GLOB_NOMATCH;

    bufnext = patbuf;
    bufend = bufnext + PATH_MAX - 1;
    if (flags & GLOB_NOESCAPE)
        while (bufnext < bufend && (c = *patnext++) != EOS)
            *bufnext++ = c;
    else {
        /* Protect the quoted characters. */
        while (bufnext < bufend && (c = *patnext++) != EOS)
            if (c == QUOTE) {
                if ((c = *patnext++) == EOS) {
                    c = QUOTE;
                    --patnext;
                }
                *bufnext++ = c | M_PROTECT;
            } else
    }
}

```

```

    *bufnext++ = c;
}
*bufnext = EOS;

if (flags & GLOB_BRACE)
    return globexp1(patbuf, pglob, &limit);
else
    return glob0(patbuf, pglob, &limit);
}

/*
 * Expand recursively a glob { } pattern. When there is no more expansion
 * invoke the standard globbing routine to glob the rest of the magic
 * characters
 */
static int
globexp1(const Char *pattern, glob_t *pglob, struct glob_lim *limitp)
{
    const Char* ptr = pattern;

    /* Protect a single {}, for find(1), like csh */
    if (pattern[0] == LBRACE && pattern[1] == RBRACE && pattern[2] == EOS)
        return glob0(pattern, pglob, limitp);

    if ((ptr = (const Char *) g_strchr(ptr, LBRACE)) != NULL)
        return globexp2(ptr, pattern, pglob, limitp);

    return glob0(pattern, pglob, limitp);
}

/*
 * Recursive brace globbing helper. Tries to expand a single brace.
 * If it succeeds then it invokes globexp1 with the new pattern.
 * If it fails then it tries to glob the rest of the pattern and returns.
 */
static int
globexp2(const Char *ptr, const Char *pattern, glob_t *pglob,
        struct glob_lim *limitp)
{
    int i, rv;
    Char *lm, *ls;
    const Char *pe, *pm, *pl;
    Char patbuf[PATH_MAX];

    /* copy part up to the brace */
    for (lm = patbuf, pm = pattern; pm != ptr; *lm++ = *pm++)
        continue;

```

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*lm = EOS;
ls = lm;

/* Find the balanced brace */
for (i = 0, pe = ++ptr; *pe; pe++)
if (*pe == LBRACKET) {
/* Ignore everything between [] */
for (pm = pe++; *pe != RBRACKET && *pe != EOS; pe++)
continue;
if (*pe == EOS) {
/*
* We could not find a matching RBRACKET.
* Ignore and just look for RBACE
*/
pe = pm;
}
} else if (*pe == LBRACE)
i++;
else if (*pe == RBRACE) {
if (i == 0)
break;
i--;
}

/* Non matching braces; just glob the pattern */
if (i != 0 || *pe == EOS)
return glob0(patbuf, pglob, limitp);

for (i = 0, pl = pm = ptr; pm <= pe; pm++) {
switch (*pm) {
case LBRACKET:
/* Ignore everything between [] */
for (pl = pm++; *pm != RBRACKET && *pm != EOS; pm++)
continue;
if (*pm == EOS) {
/*
* We could not find a matching RBRACKET.
* Ignore and just look for RBACE
*/
pm = pl;
}
break;

case LBRACE:
i++;
break;

case RBRACE:

```

```

if (i) {
    i--;
    break;
}
/* FALLTHROUGH */
case COMMA:
if (i && *pm == COMMA)
    break;
else {
    /* Append the current string */
    for (lm = ls; (pl < pm); *lm++ = *pl++)
        continue;

    /*
     * Append the rest of the pattern after the
     * closing brace
     */
    for (pl = pe + 1; (*lm++ = *pl++) != EOS;)
        continue;

    /* Expand the current pattern */
#ifdef DEBUG
    qprintf("globexp2:", patbuf);
#endif
    rv = globexpl(patbuf, pglob, limitp);
    if (rv && rv != GLOB_NOMATCH)
        return rv;

    /* move after the comma, to the next string */
    pl = pm + 1;
}
break;

default:
    break;
}
}
return 0;
}

/*
 * expand tilde from the passwd file.
 */
static const Char *
globtilde(const Char *pattern, Char *patbuf, size_t patbuf_len, glob_t *pglob)
{

```

```

struct passwd *pwd;
char *h;
const Char *p;
Char *b, *eb;

if (*pattern != TILDE || !(pglob->gl_flags & GLOB_TILDE))
    return pattern;

/* Copy up to the end of the string or / */
eb = &patbuf[patbuf_len - 1];
for (p = pattern + 1, h = (char *) patbuf;
     h < (char *)eb && *p && *p != SLASH; *h++ = *p++)
    continue;

*h = EOS;

if (((char *) patbuf)[0] == EOS) {
    /*
     * handle a plain ~ or ~/ by expanding $HOME
     * first and then trying the password file
     */
    if ((h = getenv("HOME")) == NULL) {
        if ((pwd = getpwuid(getuid())) == NULL)
            return pattern;
        else
            h = pwd->pw_dir;
    }
} else {
    /*
     * Expand a ~user
     */
    if ((pwd = getpwnam((char*) patbuf)) == NULL)
        return pattern;
    else
        h = pwd->pw_dir;
}

/* Copy the home directory */
for (b = patbuf; b < eb && *h; *b++ = *h++)
    continue;

/* Append the rest of the pattern */
while (b < eb && (*b++ = *p++) != EOS)
    continue;
*b = EOS;

return patbuf;
}

```

```

static int
g_strncmp(const Char *s1, const char *s2, size_t n)
{
    int rv = 0;

    while (n--) {
        rv = *(Char *)s1 - *(const unsigned char *)s2++;
        if (rv)
            break;
        if (*s1++ == '\0')
            break;
    }
    return rv;
}

static int
g_charclass(const Char **patternp, Char **bufnextp)
{
    const Char *pattern = *patternp + 1;
    Char *bufnext = *bufnextp;
    const Char *colon;
    struct cclass *cc;
    size_t len;

    if ((colon = g_strchr(pattern, ':')) == NULL || colon[1] != ']')
        return 1; /* not a character class */

    len = (size_t)(colon - pattern);
    for (cc = cclasses; cc->name != NULL; cc++) {
        if (!g_strncmp(pattern, cc->name, len) && cc->name[len] == '\0')
            break;
    }
    if (cc->name == NULL)
        return -1; /* invalid character class */
    *bufnext++ = M_CLASS;
    *bufnext++ = (Char)(cc - &cclasses[0]);
    *bufnextp = bufnext;
    *patternp += len + 3;

    return 0;
}

/*
 * The main glob() routine: compiles the pattern (optionally processing
 * quotes), calls glob1() to do the real pattern matching, and finally
 * sorts the list (unless unsorted operation is requested). Returns 0
 * if things went well, nonzero if errors occurred. It is not an error

```



```

* to find no matches.
*/
static int
glob0(const Char *pattern, glob_t *pglob, struct glob_lim *limitp)
{
    const Char *qpatnext;
    int c, err, oldpathc;
    Char *bufnext, patbuf[PATH_MAX];

    qpatnext = globtilde(pattern, patbuf, PATH_MAX, pglob);
    oldpathc = pglob->gl_pathc;
    bufnext = patbuf;

    /* We don't need to check for buffer overflow any more. */
    while ((c = *qpatnext++) != EOS) {
        switch (c) {
        case LBRACKET:
            c = *qpatnext;
            if (c == NOT)
                ++qpatnext;
            if (*qpatnext == EOS ||
                g_strchr(qpatnext+1, RBRACKET) == NULL) {
                *bufnext++ = LBRACKET;
                if (c == NOT)
                    --qpatnext;
                break;
            }
            *bufnext++ = M_SET;
            if (c == NOT)
                *bufnext++ = M_NOT;
            c = *qpatnext++;
            do {
                if (c == LBRACKET && *qpatnext == ':') {
                    do {
                        err = g_charclass(&qpatnext,
                            &bufnext);
                        if (err)
                            break;
                        c = *qpatnext++;
                    } while (c == LBRACKET && *qpatnext == ':');
                    if (err == -1 &&
                        !(pglob->gl_flags & GLOB_NOCHECK))
                        return GLOB_NOMATCH;
                    if (c == RBRACKET)
                        break;
                }
                *bufnext++ = CHAR(c);
                if (*qpatnext == RANGE &&

```

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    (c = qpatnext[1]) != RBRACKET) {
    *bufnext++ = M_RNG;
    *bufnext++ = CHAR(c);
    qpatnext += 2;
    }
} while ((c = *qpatnext++) != RBRACKET);
pglob->gl_flags |= GLOB_MAGCHAR;
*bufnext++ = M_END;
break;
case QUESTION:
pglob->gl_flags |= GLOB_MAGCHAR;
*bufnext++ = M_ONE;
break;
case STAR:
pglob->gl_flags |= GLOB_MAGCHAR;
/* collapse adjacent stars to one,
 * to avoid exponential behavior
 */
if (bufnext == patbuf || bufnext[-1] != M_ALL)
    *bufnext++ = M_ALL;
break;
default:
*bufnext++ = CHAR(c);
break;
}
}
*bufnext = EOS;
#ifdef DEBUG
qprintf("glob0:", patbuf);
#endif

if ((err = glob1(patbuf, patbuf + PATH_MAX - 1, pglob, limitp)) != 0)
    return err;

/*
 * If there was no match we are going to append the pattern
 * if GLOB_NOCHECK was specified.
 */
if (pglob->gl_pathc == oldpathc) {
if ((pglob->gl_flags & GLOB_NOCHECK))
    return globextend(pattern, pglob, limitp, NULL);
else
    return GLOB_NOMATCH;
}
if (!(pglob->gl_flags & GLOB_NOSORT)) {
qsort(pglob->gl_pathv + pglob->gl_offs + oldpathc,
    pglob->gl_pathc - oldpathc, sizeof(char *), compare);
}

```

```

return 0;
}

static int
compare(const void *p, const void *q)
{
return strcmp(*(char **)p, *(char **)q);
}

static int
glob1(Char *pattern, Char *pattern_last, glob_t *pglob, struct glob_lim *limitp)
{
Char pathbuf[PATH_MAX];

/* A null pathname is invalid -- POSIX 1003.1 sect. 2.4. */
if (*pattern == EOS)
return 0;
return glob2(pathbuf, pathbuf + PATH_MAX - 1,
pathbuf, pathbuf + PATH_MAX - 1,
pattern, pattern_last, pglob, limitp);
}

/*
* The functions glob2 and glob3 are mutually recursive; there is one level
* of recursion for each segment in the pattern that contains one or more
* meta characters.
*/
static int
glob2(Char *pathbuf, Char *pathbuf_last, Char *pathend, Char *pathend_last,
Char *pattern, Char *pattern_last, glob_t *pglob, struct glob_lim *limitp)
{
struct stat sb;
Char *p, *q;
int anymeta;

/*
* Loop over pattern segments until end of pattern or until
* segment with meta character found.
*/
for (anymeta = 0;;) {
if (*pattern == EOS) { /* End of pattern? */
*pathend = EOS;

if ((pglob->gl_flags & GLOB_LIMIT) &&
limitp->glim_stat++ >= GLOB_LIMIT_STAT) {
errno = 0;
*pathend++ = SEP;
*pathend = EOS;
}
}
}

```

```

return GLOB_NOSPACE;
}
if (g_lstat(pathbuf, &sb, pglob))
return 0;

if (((pglob->gl_flags & GLOB_MARK) &&
    pathend[-1] != SEP) && (S_ISDIR(sb.st_mode) ||
    (S_ISLNK(sb.st_mode) &&
    (g_stat(pathbuf, &sb, pglob) == 0) &&
    S_ISDIR(sb.st_mode)))) {
if (pathend+1 > pathend_last)
return 1;
*pathend++ = SEP;
*pathend = EOS;
}
++pglob->gl_matchc;
return globextend(pathbuf, pglob, limitp, &sb);
}

/* Find end of next segment, copy tentatively to pathend. */
q = pathend;
p = pattern;
while (*p != EOS && *p != SEP) {
if (ismeta(*p))
anymeta = 1;
if (q+1 > pathend_last)
return 1;
*q++ = *p++;
}

if (!anymeta) { /* No expansion, do next segment. */
pathend = q;
pattern = p;
while (*pattern == SEP) {
if (pathend+1 > pathend_last)
return 1;
*pathend++ = *pattern++;
}
} else
/* Need expansion, recurse. */
return glob3(pathbuf, pathbuf_last, pathend,
    pathend_last, pattern, p, pattern_last,
    pglob, limitp);
}
/* NOTREACHED */
}

static int

```

```

glob3(Char *pathbuf, Char *pathbuf_last, Char *pathend, Char *pathend_last,
      Char *pattern, Char *restpattern, Char *restpattern_last, glob_t *pglob,
      struct glob_lim *limitp)
{
    struct dirent *dp;
    DIR *dirp;
    int err;
    char buf[PATH_MAX];

    if (pathend > pathend_last)
        return 1;
    *pathend = EOS;
    errno = 0;

    if ((dirp = g_opendir(pathbuf, pglob)) == NULL) {
        /* TODO: don't call for ENOENT or ENOTDIR? */
        if (pglob->gl_errfunc) {
            if (g_Ctoc(pathbuf, buf, sizeof(buf)))
                return GLOB_ABORTED;
            if (pglob->gl_errfunc(buf, errno) ||
                pglob->gl_flags & GLOB_ERR)
                return GLOB_ABORTED;
        }
        return 0;
    }

    err = 0;

    /* Search directory for matching names. */
    while ((dp = readdir(dirp))) {
        unsigned char *sc;
        Char *dc;

        if ((pglob->gl_flags & GLOB_LIMIT) &&
            limitp->glim_readdir++ >= GLOB_LIMIT_READDIR) {
            errno = 0;
            *pathend++ = SEP;
            *pathend = EOS;
            err = GLOB_NOSPACE;
            break;
        }

        /* Initial DOT must be matched literally. */
        if (dp->d_name[0] == DOT && *pattern != DOT)
            continue;
        dc = pathend;
        sc = (unsigned char *) dp->d_name;
        while (dc < pathend_last && (*dc++ = *sc++) != EOS)

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    continue;
    if (dc >= pathend_last) {
        *dc = EOS;
        err = 1;
        break;
    }

    if (!match(pathend, pattern, restpattern, GLOB_LIMIT_RECUR)) {
        *pathend = EOS;
        continue;
    }
    err = glob2(pathbuf, pathbuf_last, --dc, pathend_last,
        restpattern, restpattern_last, pglob, limitp);
    if (err)
        break;
}

closedir(dirp);
return err;
}

/*
 * Extend the gl_pathv member of a glob_t structure to accommodate a new item,
 * add the new item, and update gl_pathc.
 *
 * This assumes the BSD realloc, which only copies the block when its size
 * crosses a power-of-two boundary; for v7 realloc, this would cause quadratic
 * behavior.
 *
 * Return 0 if new item added, error code if memory couldn't be allocated.
 *
 * Invariant of the glob_t structure:
 * Either gl_pathc is zero and gl_pathv is NULL; or gl_pathc > 0 and
 * gl_pathv points to (gl_offs + gl_pathc + 1) items.
 */
static int
globextend(const Char *path, glob_t *pglob, struct glob_lim *limitp,
    struct stat *sb)
{
    char **pathv;
    ssize_t i;
    size_t newn, len;
    char *copy = NULL;
    const Char *p;

    newn = 2 + pglob->gl_pathc + pglob->gl_offs;
    if (pglob->gl_offs >= INT_MAX ||
        pglob->gl_pathc >= INT_MAX ||

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    newn >= INT_MAX ||
    SIZE_MAX / sizeof(*pathv) <= newn) {
nospace:
for (i = pglob->gl_offs; i < (ssize_t)(newn - 2); i++) {
    if (pglob->gl_pathv && pglob->gl_pathv[i])
        free(pglob->gl_pathv[i]);
    }
    if (pglob->gl_pathv) {
        free(pglob->gl_pathv);
        pglob->gl_pathv = NULL;
    }
    return GLOB_NOSPACE;
}

pathv = reallocarray(pglob->gl_pathv, newn, sizeof(*pathv));
if (pathv == NULL)
    goto nospace;
if (pglob->gl_pathv == NULL && pglob->gl_offs > 0) {
    /* first time around -- clear initial gl_offs items */
    pathv += pglob->gl_offs;
    for (i = pglob->gl_offs; --i >= 0; )
        *--pathv = NULL;
    }
pglob->gl_pathv = pathv;

for (p = path; *p++;)
    continue;
len = (size_t)(p - path);
limitp->glim_malloc += len;
if ((copy = malloc(len)) != NULL) {
    if (g_Ctoc(path, copy, len) {
        free(copy);
        return GLOB_NOSPACE;
    }
    pathv[pglob->gl_offs + pglob->gl_pathc++] = copy;
}
pathv[pglob->gl_offs + pglob->gl_pathc] = NULL;

if ((pglob->gl_flags & GLOB_LIMIT) &&
    (newn * sizeof(*pathv)) + limitp->glim_malloc >
    GLOB_LIMIT_MALLOC) {
    errno = 0;
    return GLOB_NOSPACE;
}
return copy == NULL ? GLOB_NOSPACE : 0;
}

```

```

/*
 * pattern matching function for filenames. Each occurrence of the *
 * pattern causes a recursion level.
 */
static int
match(Char *name, Char *pat, Char *patend, int recur)
{
    int ok, negate_range;
    Char c, k;

    if (recur-- == 0)
        return GLOB_NOSPACE;

    while (pat < patend) {
        c = *pat++;
        switch (c & M_MASK) {
        case M_ALL:
            while (pat < patend && (*pat & M_MASK) == M_ALL)
                pat++; /* eat consecutive '*' */
            if (pat == patend)
                return 1;
            do {
                if (match(name, pat, patend, recur))
                    return 1;
            } while (*name++ != EOS);
            return 0;
        case M_ONE:
            if (*name++ == EOS)
                return 0;
            break;
        case M_SET:
            ok = 0;
            if ((k = *name++) == EOS)
                return 0;
            if ((negate_range = ((*pat & M_MASK) == M_NOT)) != EOS)
                ++pat;
            while (((c = *pat++) & M_MASK) != M_END) {
                if ((c & M_MASK) == M_CLASS) {
                    Char idx = *pat & M_MASK;
                    if (idx < NCCLASSES &&
                        cclasses[idx].isctype(k))
                        ok = 1;
                }
                ++pat;
            }
            if ((*pat & M_MASK) == M_RNG) {
                if (c <= k && k <= pat[1])
                    ok = 1;
                pat += 2;
            }
        }
    }
}

```



```

    } else if (c == k)
        ok = 1;
    }
    if (ok == negate_range)
        return 0;
    break;
default:
    if (*name++ != c)
        return 0;
    break;
}
}
return *name == EOS;
}

/* Free allocated data belonging to a glob_t structure. */
void
sudo_globfree(glob_t *pglob)
{
    int i;
    char **pp;

    if (pglob->gl_pathv != NULL) {
        pp = pglob->gl_pathv + pglob->gl_offs;
        for (i = pglob->gl_pathc; i--; ++pp)
            if (*pp)
                free(*pp);
        free(pglob->gl_pathv);
        pglob->gl_pathv = NULL;
    }
}

static DIR *
g_opendir(Char *str, glob_t *pglob)
{
    char buf[PATH_MAX];

    if (!*str) {
        buf[0] = '.';
        buf[1] = '\0';
    } else {
        if (g_Ctoc(str, buf, sizeof(buf)))
            return NULL;
    }

    return opendir(buf);
}

```

```

static int
g_lstat(Char *fn, struct stat *sb, glob_t *pglob)
{
    char buf[PATH_MAX];

    if (g_Ctoc(fn, buf, sizeof(buf)))
        return -1;
    return lstat(buf, sb);
}

static int
g_stat(Char *fn, struct stat *sb, glob_t *pglob)
{
    char buf[PATH_MAX];

    if (g_Ctoc(fn, buf, sizeof(buf)))
        return -1;
    return stat(buf, sb);
}

static Char *
g_strchr(const Char *str, int ch)
{
    do {
        if (*str == ch)
            return (Char *)str;
    } while (*str++);
    return NULL;
}

static int
g_Ctoc(const Char *str, char *buf, unsigned int len)
{
    while (len--) {
        if ((*buf++ = *str++) == EOS)
            return 0;
    }
    return 1;
}

#ifdef DEBUG
static void
qprintf(const char *str, Char *s)
{
    Char *p;

    (void)printf("%s:\n", str);
}

```

```

for (p = s; *p; p++)
    (void)printf("%c", CHAR(*p));
(void)printf("\n");
for (p = s; *p; p++)
    (void)printf("%c", *p & M_PROTECT ? "" : ' ');
(void)printf("\n");
for (p = s; *p; p++)
    (void)printf("%c", ismeta(*p) ? '_' : ' ');
(void)printf("\n");
}
#endif /* DEBUG */
#endif /* HAVE_GLOB */
/*
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 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
 * SUCH DAMAGE.
 */

#include <config.h>

#ifndef HAVE_GETCWD

#include <sys/types.h>
#include <sys/stat.h>

```

```

#include <errno.h>
#include <stdio.h>
#include <stdlib.h>
#ifdef HAVE_STRING_H
# include <string.h>
#endif /* HAVE_STRING_H */
#ifdef HAVE_STRINGS_H
# include <strings.h>
#endif /* HAVE_STRINGS_H */
#include <unistd.h>
#include <dirent.h>

#include "sudo_compat.h"

#define ISDOT(dp) \
(dp->d_name[0] == '.' && (dp->d_name[1] == '\0' || \
(dp->d_name[1] == '.' && dp->d_name[2] == '\0')))

#if defined(HAVE_STRUCT_DIRENT_D_NAMLEN) && HAVE_STRUCT_DIRENT_D_NAMLEN
# define NAMLEN(dirent) (dirent)->d_namlen
#else
# define NAMLEN(dirent) strlen((dirent)->d_name)
#endif

char *
sudo_getcwd(char *pt, size_t size)
{
    struct dirent *dp;
    DIR *dir = NULL;
    dev_t dev;
    ino_t ino;
    int first;
    char *bpt, *bup;
    struct stat s;
    dev_t root_dev;
    ino_t root_ino;
    size_t psize, upsize;
    int save_errno;
    char *ept, *eup, *up;

    /*
     * If no buffer specified by the user, allocate one as necessary.
     * If a buffer is specified, the size has to be non-zero. The path
     * is built from the end of the buffer backwards.
     */
    if (pt) {
        psize = 0;
        if (!size) {

```

```

    errno = EINVAL;
    return NULL;
}
ept = pt + size;
} else {
    if ((pt = malloc(ptime = 1024 - 4)) == NULL)
        return NULL;
    ept = pt + ptime;
}
bpt = ept - 1;
*bpt = '\0';

/*
 * Allocate bytes (1024 - malloc space) for the string of "../"s.
 * Should always be enough (it's 340 levels). If it's not, allocate
 * as necessary. Special * case the first stat, it's ".", not "..".
 */
if ((up = malloc(upspace = 1024 - 4)) == NULL)
    goto err;
eup = up + PATH_MAX;
bup = up;
up[0] = '.';
up[1] = '\0';

/* Save root values, so know when to stop. */
if (stat("/", &s))
    goto err;
root_dev = s.st_dev;
root_ino = s.st_ino;

errno = 0; /* XXX readdir has no error return. */

for (first = 1;; first = 0) {
    /* Stat the current level. */
    if (lstat(up, &s))
        goto err;

    /* Save current node values. */
    ino = s.st_ino;
    dev = s.st_dev;

    /* Check for reaching root. */
    if (root_dev == dev && root_ino == ino) {
        *--bpt = '/';
        /*
         * It's unclear that it's a requirement to copy the
         * path to the beginning of the buffer, but it's always
         * been that way and stuff would probably break.

```

```

    */
    bcopy(bpt, pt, ept - bpt);
    free(up);
    return pt;
}

/*
 * Build pointer to the parent directory, allocating memory
 * as necessary. Max length is 3 for "../", the largest
 * possible component name, plus a trailing NULL.
 */
if (bup + 3 + MAXNAMLEN + 1 >= eup) {
    char *nup;

    if ((nup = reallocarray(up, upsize, 2)) == NULL)
        goto err;
    upsize *= 2;
    up = nup;
    bup = up;
    eup = up + upsize;
}
*bup++ = '.';
*bup++ = '.';
*bup = '\0';

/* Open and stat parent directory. */
if (!(dir = opendir(up)) || fstat(dirfd(dir), &s))
    goto err;

/* Add trailing slash for next directory. */
*bup++ = '/';

/*
 * If it's a mount point, have to stat each element because
 * the inode number in the directory is for the entry in the
 * parent directory, not the inode number of the mounted file.
 */
save_errno = 0;
if (s.st_dev == dev) {
    for (;;) {
        if (!(dp = readdir(dir)))
            goto notfound;
        if (dp->d_fileno == ino)
            break;
    }
} else
    for (;;) {
        if (!(dp = readdir(dir)))

```

```

    goto notfound;
if (ISDOT(dp))
    continue;
bcopy(dp->d_name, bup, NAMLEN(dp) + 1);

/* Save the first error for later. */
if (lstat(up, &s)) {
    if (!save_errno)
        save_errno = errno;
    errno = 0;
    continue;
}
if (s.st_dev == dev && s.st_ino == ino)
    break;
}

/*
 * Check for length of the current name, preceding slash,
 * leading slash.
 */
if (bpt - pt <= NAMLEN(dp) + (first ? 1 : 2)) {
    size_t len, off;
    char *npt;

    if (!ptsize) {
        errno = ERANGE;
        goto err;
    }
    off = bpt - pt;
    len = ept - bpt;
    if ((npt = reallocarray(pt, psize, 2)) == NULL)
        goto err;
    psize *= 2;
    pt = npt;
    bpt = pt + off;
    ept = pt + psize;
    bcopy(bpt, ept - len, len);
    bpt = ept - len;
}
if (!first)
    *--bpt = '/';
bpt -= NAMLEN(dp);
bcopy(dp->d_name, bpt, NAMLEN(dp));
(void)closedir(dir);

/* Truncate any file name. */
*bup = '\0';
}

```

```

notfound:
/*
 * If readdir set errno, use it, not any saved error; otherwise,
 * didn't find the current directory in its parent directory, set
 * errno to ENOENT.
 */
if (!errno)
    errno = save_errno ? save_errno : ENOENT;
/* FALLTHROUGH */
err:
if (ptsize)
    free(pt);
if (up)
    free(up);
if (dir)
    (void)closedir(dir);
return NULL;
}
#endif /* HAVE_GETCWD */
/*
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 */

```



```
* @(#)queue.h 8.5 (Berkeley) 8/20/94
* $FreeBSD: head/sys/sys/queue.h 251887 2013-06-18 02:57:56Z lstewart $
*/
```

```
#ifndef SUDO_QUEUE_H
#define SUDO_QUEUE_H
```

```
/*
```

```
* This file defines four types of data structures: singly-linked lists,
* singly-linked tail queues, lists and tail queues.
```

```
*
```

```
* A singly-linked list is headed by a single forward pointer. The elements
* are singly linked for minimum space and pointer manipulation overhead at
* the expense of O(n) removal for arbitrary elements. New elements can be
* added to the list after an existing element or at the head of the list.
```

```
* Elements being removed from the head of the list should use the explicit
* macro for this purpose for optimum efficiency. A singly-linked list may
* only be traversed in the forward direction. Singly-linked lists are ideal
* for applications with large datasets and few or no removals or for
* implementing a LIFO queue.
```

```
*
```

```
* A singly-linked tail queue is headed by a pair of pointers, one to the
* head of the list and the other to the tail of the list. The elements are
* singly linked for minimum space and pointer manipulation overhead at the
* expense of O(n) removal for arbitrary elements. New elements can be added
* to the list after an existing element, at the head of the list, or at the
* end of the list. Elements being removed from the head of the tail queue
* should use the explicit macro for this purpose for optimum efficiency.
```

```
* A singly-linked tail queue may only be traversed in the forward direction.
* Singly-linked tail queues are ideal for applications with large datasets
* and few or no removals or for implementing a FIFO queue.
```

```
*
```

```
* A list is headed by a single forward pointer (or an array of forward
* pointers for a hash table header). The elements are doubly linked
* so that an arbitrary element can be removed without a need to
* traverse the list. New elements can be added to the list before
* or after an existing element or at the head of the list. A list
* may be traversed in either direction.
```

```
*
```

```
* A tail queue is headed by a pair of pointers, one to the head of the
* list and the other to the tail of the list. The elements are doubly
* linked so that an arbitrary element can be removed without a need to
* traverse the list. New elements can be added to the list before or
* after an existing element, at the head of the list, or at the end of
* the list. A tail queue may be traversed in either direction.
```

```
*
```

```
* A headless tail queue lacks a head structure, The first element acts
* as a de facto list head. It uses the same entry struct as a regular
```

- \* tail queue for easy conversion from headless to headful.
- \* It is capable of concatenating queues as well as individual elements.
- \* Traversing in reverse is more expensive due to lack of a list head.
- \* Note: elements must be initialized before use.

\*

- \* For details on the use of these macros, see the queue(3) manual page.

\*

\*

\* SLIST LIST STAILQ TAILQ

\* \_HEAD + + + +

\* \_HEAD\_INITIALIZER + + + +

\* \_ENTRY + + + +

\* \_INIT + + + +

\* \_EMPTY + + + +

\* \_FIRST + + + +

\* \_NEXT + + + +

\* \_PREV - - - +

\* \_LAST - - - +

\* \_FOREACH + + + +

\* \_FOREACH\_FROM + + + +

\* \_FOREACH\_SAFE + + + +

\* \_FOREACH\_FROM\_SAFE + + + +

\* \_FOREACH\_REVERSE - - - +

\* \_FOREACH\_REVERSE\_FROM - - - +

\* \_FOREACH\_REVERSE\_SAFE - - - +

\* \_FOREACH\_REVERSE\_FROM\_SAFE - - - +

\* \_INSERT\_HEAD + + + +

\* \_INSERT\_BEFORE - - - +

\* \_INSERT\_AFTER + + + +

\* \_INSERT\_TAIL - - - +

\* \_CONCAT - - - +

\* \_REMOVE\_AFTER + - - -

\* \_REMOVE\_HEAD + - - -

\* \_REMOVE + + + +

\* \_SWAP + + + +

\*

\*/

#ifdef QUEUE\_MACRO\_DEBUG

/\* Store the last 2 places the queue element or head was altered \*/

struct qm\_trace {

  unsigned long lastline;

  unsigned long prevline;

  const char \*lastfile;

  const char \*prevfile;

};

#undef TRACEBUF

#define TRACEBUF struct qm\_trace trace;

```

#undef TRACEBUF_INITIALIZER
#define TRACEBUF_INITIALIZER { __FILE__, __LINE__, NULL, 0 },
#undef TRASHIT
#define TRASHIT(x) do {(x) = (void *)-1;} while (0)
#undef QMD_SAVELINK
#define QMD_SAVELINK(name, link) void **name = (void *)&(link)

#undef QMD_TRACE_HEAD
#define QMD_TRACE_HEAD(head) do { \
(head)->trace.prevline = (head)->trace.lastline; \
(head)->trace.prevfile = (head)->trace.lastfile; \
(head)->trace.lastline = __LINE__; \
(head)->trace.lastfile = __FILE__; \
} while (0)

#undef QMD_TRACE_ELEM
#define QMD_TRACE_ELEM(elem) do { \
(elem)->trace.prevline = (elem)->trace.lastline; \
(elem)->trace.prevfile = (elem)->trace.lastfile; \
(elem)->trace.lastline = __LINE__; \
(elem)->trace.lastfile = __FILE__; \
} while (0)

#else
#undef QMD_TRACE_ELEM
#define QMD_TRACE_ELEM(elem)
#undef QMD_TRACE_HEAD
#define QMD_TRACE_HEAD(head)
#undef QMD_SAVELINK
#define QMD_SAVELINK(name, link)
#undef TRACEBUF
#define TRACEBUF
#undef TRACEBUF_INITIALIZER
#define TRACEBUF_INITIALIZER
#undef TRASHIT
#define TRASHIT(x)
#endif /* QUEUE_MACRO_DEBUG */

/*
 * Singly-linked List declarations.
 */
#undef SLIST_HEAD
#define SLIST_HEAD(name, type) \
struct name { \
struct type *slh_first; /* first element */ \
}

#undef SLIST_HEAD_INITIALIZER

```

```

#define SLIST_HEAD_INITIALIZER(head) \
{ NULL }

#undef SLIST_ENTRY
#define SLIST_ENTRY(type) \
struct { \
    struct type *sle_next; /* next element */ \
}

/*
 * Singly-linked List functions.
 */
#undef SLIST_EMPTY
#define SLIST_EMPTY(head) ((head)->slh_first == NULL)

#undef SLIST_FIRST
#define SLIST_FIRST(head) ((head)->slh_first)

#undef SLIST_FOREACH
#define SLIST_FOREACH(var, head, field) \
for ((var) = SLIST_FIRST((head)); \
    (var); \
    (var) = SLIST_NEXT((var), field))

#undef SLIST_FOREACH_FROM
#define SLIST_FOREACH_FROM(var, head, field) \
for ((var) = ((var) ? (var) : SLIST_FIRST((head))); \
    (var); \
    (var) = SLIST_NEXT((var), field))

#undef SLIST_FOREACH_SAFE
#define SLIST_FOREACH_SAFE(var, head, field, tvar) \
for ((var) = SLIST_FIRST((head)); \
    (var) && ((tvar) = SLIST_NEXT((var), field), 1); \
    (var) = (tvar))

#undef SLIST_FOREACH_FROM_SAFE
#define SLIST_FOREACH_FROM_SAFE(var, head, field, tvar) \
for ((var) = ((var) ? (var) : SLIST_FIRST((head))); \
    (var) && ((tvar) = SLIST_NEXT((var), field), 1); \
    (var) = (tvar))

#undef SLIST_FOREACH_PREVPTR
#define SLIST_FOREACH_PREVPTR(var, varp, head, field) \
for ((varp) = &SLIST_FIRST((head)); \
    ((var) = *(varp)) != NULL; \
    (varp) = &SLIST_NEXT((var), field))

```

```

#undef SLIST_INIT
#define SLIST_INIT(head) do { \
    SLIST_FIRST((head)) = NULL; \
} while (0)

#undef SLIST_INSERT_AFTER
#define SLIST_INSERT_AFTER(slistelm, elm, field) do { \
    SLIST_NEXT((elm), field) = SLIST_NEXT((slistelm), field); \
    SLIST_NEXT((slistelm), field) = (elm); \
} while (0)

#undef SLIST_INSERT_HEAD
#define SLIST_INSERT_HEAD(head, elm, field) do { \
    SLIST_NEXT((elm), field) = SLIST_FIRST((head)); \
    SLIST_FIRST((head)) = (elm); \
} while (0)

#undef SLIST_NEXT
#define SLIST_NEXT(elm, field) ((elm)->field.sle_next)

#undef SLIST_REMOVE
#define SLIST_REMOVE(head, elm, type, field) do { \
    QMD_SAVELINK(oldnext, (elm)->field.sle_next); \
    if (SLIST_FIRST((head)) == (elm)) { \
        SLIST_REMOVE_HEAD((head), field); \
    } \
    else { \
        struct type *curelm = SLIST_FIRST((head)); \
        while (SLIST_NEXT(curelm, field) != (elm)) \
            curelm = SLIST_NEXT(curelm, field); \
        SLIST_REMOVE_AFTER(curelm, field); \
    } \
    TRASHIT(*oldnext); \
} while (0)

#undef SLIST_REMOVE_AFTER
#define SLIST_REMOVE_AFTER(elm, field) do { \
    SLIST_NEXT(elm, field) = \
        SLIST_NEXT(SLIST_NEXT(elm, field), field); \
} while (0)

#undef SLIST_REMOVE_HEAD
#define SLIST_REMOVE_HEAD(head, field) do { \
    SLIST_FIRST((head)) = SLIST_NEXT(SLIST_FIRST((head)), field); \
} while (0)

#undef SLIST_SWAP
#define SLIST_SWAP(head1, head2, type) do { \

```

```

struct type *swap_first = SLIST_FIRST(head1); \
SLIST_FIRST(head1) = SLIST_FIRST(head2); \
SLIST_FIRST(head2) = swap_first; \
} while (0)

/*
* Singly-linked Tail queue declarations.
*/
#undef STAILQ_HEAD
#define STAILQ_HEAD(name, type) \
struct name { \
    struct type *stqh_first; /* first element */ \
    struct type **stqh_last; /* addr of last next element */ \
}

#undef STAILQ_HEAD_INITIALIZER
#define STAILQ_HEAD_INITIALIZER(head) \
{ NULL, &(head).stqh_first }

#undef STAILQ_ENTRY
#define STAILQ_ENTRY(type) \
struct { \
    struct type *stqe_next; /* next element */ \
}

/*
* Singly-linked Tail queue functions.
*/
#undef STAILQ_CONCAT
#define STAILQ_CONCAT(head1, head2) do { \
    if (!STAILQ_EMPTY((head2))) { \
        *(head1)->stqh_last = (head2)->stqh_first; \
        (head1)->stqh_last = (head2)->stqh_last; \
        STAILQ_INIT((head2)); \
    } \
} while (0)

#undef STAILQ_EMPTY
#define STAILQ_EMPTY(head) ((head)->stqh_first == NULL)

#undef STAILQ_FIRST
#define STAILQ_FIRST(head) ((head)->stqh_first)

#undef STAILQ_FOREACH
#define STAILQ_FOREACH(var, head, field) \
for ((var) = STAILQ_FIRST((head)); \
    (var); \
    (var) = STAILQ_NEXT((var), field))

```

```

#undef STAILQ_FOREACH_FROM
#define STAILQ_FOREACH_FROM(var, head, field) \
for ((var) = ((var) ? (var) : STAILQ_FIRST((head))); \
    (var); \
    (var) = STAILQ_NEXT((var), field))

#undef STAILQ_FOREACH_SAFE
#define STAILQ_FOREACH_SAFE(var, head, field, tvar) \
for ((var) = STAILQ_FIRST((head)); \
    (var) && ((tvar) = STAILQ_NEXT((var), field), 1); \
    (var) = (tvar))

#undef STAILQ_FOREACH_FROM_SAFE
#define STAILQ_FOREACH_FROM_SAFE(var, head, field, tvar) \
for ((var) = ((var) ? (var) : STAILQ_FIRST((head))); \
    (var) && ((tvar) = STAILQ_NEXT((var), field), 1); \
    (var) = (tvar))

#undef STAILQ_INIT
#define STAILQ_INIT(head) do { \
    STAILQ_FIRST((head)) = NULL; \
    (head)->stqh_last = &STAILQ_FIRST((head)); \
} while (0)

#undef STAILQ_INSERT_AFTER
#define STAILQ_INSERT_AFTER(head, tqelm, elm, field) do { \
if ((STAILQ_NEXT((elm), field) = STAILQ_NEXT((tqelm), field)) == NULL) \
    (head)->stqh_last = &STAILQ_NEXT((elm), field); \
    STAILQ_NEXT((tqelm), field) = (elm); \
} while (0)

#undef STAILQ_INSERT_HEAD
#define STAILQ_INSERT_HEAD(head, elm, field) do { \
if ((STAILQ_NEXT((elm), field) = STAILQ_FIRST((head))) == NULL) \
    (head)->stqh_last = &STAILQ_NEXT((elm), field); \
    STAILQ_FIRST((head)) = (elm); \
} while (0)

#undef STAILQ_INSERT_TAIL
#define STAILQ_INSERT_TAIL(head, elm, field) do { \
    STAILQ_NEXT((elm), field) = NULL; \
    *(head)->stqh_last = (elm); \
    (head)->stqh_last = &STAILQ_NEXT((elm), field); \
} while (0)

#undef STAILQ_LAST
#define STAILQ_LAST(head, type, field) \

```

```

(STAILQ_EMPTY((head)) ? NULL : \
    __containerof((head)->stqh_last, struct type, field.stqe_next))

#undef STAILQ_NEXT
#define STAILQ_NEXT(elm, field) ((elm)->field.stqe_next)

#undef STAILQ_REMOVE
#define STAILQ_REMOVE(head, elm, type, field) do { \
    QMD_SAVELINK(oldnext, (elm)->field.stqe_next); \
    if (STAILQ_FIRST((head)) == (elm)) { \
        STAILQ_REMOVE_HEAD((head), field); \
    } \
    else { \
        struct type *curelm = STAILQ_FIRST((head)); \
        while (STAILQ_NEXT(curelm, field) != (elm)) \
            curelm = STAILQ_NEXT(curelm, field); \
        STAILQ_REMOVE_AFTER(head, curelm, field); \
    } \
    TRASHIT(*oldnext); \
} while (0)

#undef STAILQ_REMOVE_AFTER
#define STAILQ_REMOVE_AFTER(head, elm, field) do { \
    if ((STAILQ_NEXT(elm, field) = \
        STAILQ_NEXT(STAILQ_NEXT(elm, field), field)) == NULL) \
        (head)->stqh_last = &STAILQ_NEXT((elm), field); \
} while (0)

#undef STAILQ_REMOVE_HEAD
#define STAILQ_REMOVE_HEAD(head, field) do { \
    if ((STAILQ_FIRST((head)) = \
        STAILQ_NEXT(STAILQ_FIRST((head)), field)) == NULL) \
        (head)->stqh_last = &STAILQ_FIRST((head)); \
} while (0)

#undef STAILQ_SWAP
#define STAILQ_SWAP(head1, head2, type) do { \
    struct type *swap_first = STAILQ_FIRST(head1); \
    struct type **swap_last = (head1)->stqh_last; \
    STAILQ_FIRST(head1) = STAILQ_FIRST(head2); \
    (head1)->stqh_last = (head2)->stqh_last; \
    STAILQ_FIRST(head2) = swap_first; \
    (head2)->stqh_last = swap_last; \
    if (STAILQ_EMPTY(head1)) \
        (head1)->stqh_last = &STAILQ_FIRST(head1); \
    if (STAILQ_EMPTY(head2)) \
        (head2)->stqh_last = &STAILQ_FIRST(head2); \
} while (0)

```



```

/*
 * List declarations.
 */
#undef LIST_HEAD
#define LIST_HEAD(name, type) \
struct name { \
    struct type *lh_first; /* first element */ \
}

#undef LIST_HEAD_INITIALIZER
#define LIST_HEAD_INITIALIZER(head) \
{ NULL }

#undef LIST_ENTRY
#define LIST_ENTRY(type) \
struct { \
    struct type *le_next; /* next element */ \
    struct type **le_prev; /* address of previous next element */ \
}

/*
 * List functions.
 */
#undef LIST_EMPTY
#define LIST_EMPTY(head) ((head)->lh_first == NULL)

#undef LIST_FIRST
#define LIST_FIRST(head) ((head)->lh_first)

#undef LIST_FOREACH
#define LIST_FOREACH(var, head, field) \
for ((var) = LIST_FIRST((head)); \
    (var); \
    (var) = LIST_NEXT((var), field))

#undef LIST_FOREACH_FROM
#define LIST_FOREACH_FROM(var, head, field) \
for ((var) = ((var) ? (var) : LIST_FIRST((head))); \
    (var); \
    (var) = LIST_NEXT((var), field))

#undef LIST_FOREACH_SAFE
#define LIST_FOREACH_SAFE(var, head, field, tvar) \
for ((var) = LIST_FIRST((head)); \
    (var) && ((tvar) = LIST_NEXT((var), field), 1); \
    (var) = (tvar))

```

```

#undef LIST_FOREACH_FROM_SAFE
#define LIST_FOREACH_FROM_SAFE(var, head, field, tvar) \
for ((var) = ((var) ? (var) : LIST_FIRST((head))); \
    (var) && ((tvar) = LIST_NEXT((var), field), 1); \
    (var) = (tvar))

#undef LIST_INIT
#define LIST_INIT(head) do { \
    LIST_FIRST((head)) = NULL; \
} while (0)

#undef LIST_INSERT_AFTER
#define LIST_INSERT_AFTER(listelm, elm, field) do { \
if ((LIST_NEXT((elm), field) = LIST_NEXT((listelm), field)) != NULL)\
    LIST_NEXT((listelm), field)->field.le_prev = \
        &LIST_NEXT((elm), field); \
LIST_NEXT((listelm), field) = (elm); \
(elm)->field.le_prev = &LIST_NEXT((listelm), field); \
} while (0)

#undef LIST_INSERT_BEFORE
#define LIST_INSERT_BEFORE(listelm, elm, field) do { \
(elm)->field.le_prev = (listelm)->field.le_prev; \
LIST_NEXT((elm), field) = (listelm); \
*(listelm)->field.le_prev = (elm); \
(listelm)->field.le_prev = &LIST_NEXT((elm), field); \
} while (0)

#undef LIST_INSERT_HEAD
#define LIST_INSERT_HEAD(head, elm, field) do { \
if ((LIST_NEXT((elm), field) = LIST_FIRST((head))) != NULL) \
    LIST_FIRST((head))->field.le_prev = &LIST_NEXT((elm), field);\
LIST_FIRST((head)) = (elm); \
(elm)->field.le_prev = &LIST_FIRST((head)); \
} while (0)

#undef LIST_NEXT
#define LIST_NEXT(elm, field) ((elm)->field.le_next)

#undef LIST_PREV
#define LIST_PREV(elm, head, type, field) \
((elm)->field.le_prev == &LIST_FIRST((head)) ? NULL : \
    __containerof((elm)->field.le_prev, struct type, field.le_next))

#undef LIST_REMOVE
#define LIST_REMOVE(elm, field) do { \
    QMD_SAVELINK(oldnext, (elm)->field.le_next); \
} while (0)

```

```

QMD_SAVELINK(oldprev, (elm)->field.le_prev); \
if (LIST_NEXT((elm), field) != NULL) \
LIST_NEXT((elm), field)->field.le_prev = \
    (elm)->field.le_prev; \
*(elm)->field.le_prev = LIST_NEXT((elm), field); \
TRASHIT(*oldnext); \
TRASHIT(*oldprev); \
} while (0)

#undef LIST_SWAP
#define LIST_SWAP(head1, head2, type, field) do { \
    struct type *swap_tmp = LIST_FIRST((head1)); \
    LIST_FIRST((head1)) = LIST_FIRST((head2)); \
    LIST_FIRST((head2)) = swap_tmp; \
    if ((swap_tmp = LIST_FIRST((head1))) != NULL) \
        swap_tmp->field.le_prev = &LIST_FIRST((head1)); \
    if ((swap_tmp = LIST_FIRST((head2))) != NULL) \
        swap_tmp->field.le_prev = &LIST_FIRST((head2)); \
} while (0)

/*
 * Tail queue declarations.
 */
#undef TAILQ_HEAD
#define TAILQ_HEAD(name, type) \
    struct name { \
        struct type *tqh_first; /* first element */ \
        struct type **tqh_last; /* addr of last next element */ \
        TRACEBUF \
    }

#undef TAILQ_HEAD_INITIALIZER
#define TAILQ_HEAD_INITIALIZER(head) \
    { NULL, &(head).tqh_first, TRACEBUF_INITIALIZER }

#undef TAILQ_ENTRY
#define TAILQ_ENTRY(type) \
    struct { \
        struct type *tqe_next; /* next element */ \
        struct type **tqe_prev; /* address of previous next element */ \
        TRACEBUF \
    }

/*
 * Tail queue functions.
 */
#undef TAILQ_CONCAT
#define TAILQ_CONCAT(head1, head2, field) do { \

```

```

if (!TAILQ_EMPTY(head2)) { \
    *(head1)->tqh_last = (head2)->tqh_first; \
    (head2)->tqh_first->field.tqe_prev = (head1)->tqh_last; \
    (head1)->tqh_last = (head2)->tqh_last; \
    TAILQ_INIT((head2)); \
    QMD_TRACE_HEAD(head1); \
    QMD_TRACE_HEAD(head2); \
} \
} while (0)

#undef TAILQ_EMPTY
#define TAILQ_EMPTY(head) ((head)->tqh_first == NULL)

#undef TAILQ_FIRST
#define TAILQ_FIRST(head) ((head)->tqh_first)

#undef TAILQ_FOREACH
#define TAILQ_FOREACH(var, head, field) \
    for ((var) = TAILQ_FIRST((head)); \
        (var); \
        (var) = TAILQ_NEXT((var), field))

#undef TAILQ_FOREACH_FROM
#define TAILQ_FOREACH_FROM(var, head, field) \
    for ((var) = ((var) ? (var) : TAILQ_FIRST((head))); \
        (var); \
        (var) = TAILQ_NEXT((var), field))

#undef TAILQ_FOREACH_SAFE
#define TAILQ_FOREACH_SAFE(var, head, field, tvar) \
    for ((var) = TAILQ_FIRST((head)); \
        (var) && ((tvar) = TAILQ_NEXT((var), field), 1); \
        (var) = (tvar))

#undef TAILQ_FOREACH_FROM_SAFE
#define TAILQ_FOREACH_FROM_SAFE(var, head, field, tvar) \
    for ((var) = ((var) ? (var) : TAILQ_FIRST((head))); \
        (var) && ((tvar) = TAILQ_NEXT((var), field), 1); \
        (var) = (tvar))

#undef TAILQ_FOREACH_REVERSE
#define TAILQ_FOREACH_REVERSE(var, head, headname, field) \
    for ((var) = TAILQ_LAST((head), headname); \
        (var); \
        (var) = TAILQ_PREV((var), headname, field))

#undef TAILQ_FOREACH_REVERSE_FROM
#define TAILQ_FOREACH_REVERSE_FROM(var, head, headname, field) \

```

```

for ((var) = ((var) ? (var) : TAILQ_LAST((head), headname)); \
    (var); \
    (var) = TAILQ_PREV((var), headname, field))

#undef TAILQ_FOREACH_REVERSE_SAFE
#define TAILQ_FOREACH_REVERSE_SAFE(var, head, headname, field, tvar) \
for ((var) = TAILQ_LAST((head), headname); \
    (var) && ((tvar) = TAILQ_PREV((var), headname, field), 1); \
    (var) = (tvar))

#undef TAILQ_FOREACH_REVERSE_FROM_SAFE
#define TAILQ_FOREACH_REVERSE_FROM_SAFE(var, head, headname, field, tvar) \
for ((var) = ((var) ? (var) : TAILQ_LAST((head), headname)); \
    (var) && ((tvar) = TAILQ_PREV((var), headname, field), 1); \
    (var) = (tvar))

#undef TAILQ_INIT
#define TAILQ_INIT(head) do { \
    TAILQ_FIRST((head)) = NULL; \
    (head)->tqh_last = &TAILQ_FIRST((head)); \
    QMD_TRACE_HEAD(head); \
} while (0)

#undef TAILQ_INSERT_AFTER
#define TAILQ_INSERT_AFTER(head, listelm, elm, field) do { \
if ((TAILQ_NEXT((elm), field) = TAILQ_NEXT((listelm), field)) != NULL) \
    TAILQ_NEXT((elm), field)->field.tqe_prev = \
        &TAILQ_NEXT((elm), field); \
else { \
    (head)->tqh_last = &TAILQ_NEXT((elm), field); \
    QMD_TRACE_HEAD(head); \
} \
TAILQ_NEXT((listelm), field) = (elm); \
(elm)->field.tqe_prev = &TAILQ_NEXT((listelm), field); \
QMD_TRACE_ELEM(&(elm)->field); \
QMD_TRACE_ELEM(&listelm->field); \
} while (0)

#undef TAILQ_INSERT_BEFORE
#define TAILQ_INSERT_BEFORE(listelm, elm, field) do { \
(elm)->field.tqe_prev = (listelm)->field.tqe_prev; \
TAILQ_NEXT((elm), field) = (listelm); \
*(listelm)->field.tqe_prev = (elm); \
(listelm)->field.tqe_prev = &TAILQ_NEXT((elm), field); \
QMD_TRACE_ELEM(&(elm)->field); \
QMD_TRACE_ELEM(&listelm->field); \
} while (0)

```

```

#undef TAILQ_INSERT_HEAD
#define TAILQ_INSERT_HEAD(head, elm, field) do { \
if ((TAILQ_NEXT((elm), field) = TAILQ_FIRST((head))) != NULL) \
TAILQ_FIRST((head))->field.tqe_prev = \
&TAILQ_NEXT((elm), field); \
else \
(head)->tqh_last = &TAILQ_NEXT((elm), field); \
TAILQ_FIRST((head)) = (elm); \
(elm)->field.tqe_prev = &TAILQ_FIRST((head)); \
QMD_TRACE_HEAD(head); \
QMD_TRACE_ELEM(&(elm)->field); \
} while (0)

```

```

#undef TAILQ_INSERT_TAIL
#define TAILQ_INSERT_TAIL(head, elm, field) do { \
TAILQ_NEXT((elm), field) = NULL; \
(elm)->field.tqe_prev = (head)->tqh_last; \
*(head)->tqh_last = (elm); \
(head)->tqh_last = &TAILQ_NEXT((elm), field); \
QMD_TRACE_HEAD(head); \
QMD_TRACE_ELEM(&(elm)->field); \
} while (0)

```

```

#undef TAILQ_LAST
#define TAILQ_LAST(head, headname) \
(*(((struct headname *) (head)->tqh_last)->tqh_last))

```

```

#undef TAILQ_NEXT
#define TAILQ_NEXT(elm, field) ((elm)->field.tqe_next)

```

```

#undef TAILQ_PREV
#define TAILQ_PREV(elm, headname, field) \
(*(((struct headname *) (elm)->field.tqe_prev)->tqh_last))

```

```

#undef TAILQ_REMOVE
#define TAILQ_REMOVE(head, elm, field) do { \
QMD_SAVELINK(oldnext, (elm)->field.tqe_next); \
QMD_SAVELINK(oldprev, (elm)->field.tqe_prev); \
if ((TAILQ_NEXT((elm), field)) != NULL) \
TAILQ_NEXT((elm), field)->field.tqe_prev = \
(elm)->field.tqe_prev; \
else { \
(head)->tqh_last = (elm)->field.tqe_prev; \
QMD_TRACE_HEAD(head); \
} \
*(elm)->field.tqe_prev = TAILQ_NEXT((elm), field); \
TRASHIT(*oldnext); \
TRASHIT(*oldprev); \
}

```

```

QMD_TRACE_ELEM(&(elm)->field); \
} while (0)

#undef TAILQ_SWAP
#define TAILQ_SWAP(head1, head2, type, field) do { \
    struct type *swap_first = (head1)->tqh_first; \
    struct type **swap_last = (head1)->tqh_last; \
    (head1)->tqh_first = (head2)->tqh_first; \
    (head1)->tqh_last = (head2)->tqh_last; \
    (head2)->tqh_first = swap_first; \
    (head2)->tqh_last = swap_last; \
    if ((swap_first = (head1)->tqh_first) != NULL) \
        swap_first->field.tqe_prev = &(head1)->tqh_first; \
    else \
        (head1)->tqh_last = &(head1)->tqh_first; \
    if ((swap_first = (head2)->tqh_first) != NULL) \
        swap_first->field.tqe_prev = &(head2)->tqh_first; \
    else \
        (head2)->tqh_last = &(head2)->tqh_first; \
} while (0)

/*
 * Headless Tail queue definitions.
 */
#undef HLTQ_ENTRY
#define HLTQ_ENTRY(type) TAILQ_ENTRY(type)

#undef HLTQ_INIT
#define HLTQ_INIT(entry, field) do { \
    (entry)->field.tqe_next = NULL; \
    (entry)->field.tqe_prev = &(entry)->field.tqe_next; \
} while (0)

#undef HLTQ_INITIALIZER
#define HLTQ_INITIALIZER(entry, field) \
    { NULL, &(entry)->field.tqe_next }

#undef HLTQ_FIRST
#define HLTQ_FIRST(elm) (elm)

#undef HLTQ_END
#define HLTQ_END(elm) NULL

#undef HLTQ_NEXT
#define HLTQ_NEXT(elm, field) ((elm)->field.tqe_next)

#undef HLTQ_LAST
#define HLTQ_LAST(elm, type, field) \

```

```

((elm)->field.tqe_next == NULL ? (elm) : \
    __containerof((elm)->field.tqe_prev, struct type, field.tqe_next))

#undef HLTQ_PREV
#define HLTQ_PREV(elm, type, field) \
    (*(elm)->field.tqe_prev == NULL ? NULL : \
        __containerof((elm)->field.tqe_prev, struct type, field.tqe_next))

#undef HLTQ_FOREACH
#define HLTQ_FOREACH(var, head, field) \
    for ((var) = HLTQ_FIRST(head); \
        (var) != HLTQ_END(head); \
        (var) = HLTQ_NEXT(var, field))

#undef HLTQ_FOREACH_SAFE
#define HLTQ_FOREACH_SAFE(var, head, field, tvar) \
    for ((var) = HLTQ_FIRST(head); \
        (var) != HLTQ_END(head) && \
        ((tvar) = HLTQ_NEXT(var, field), 1); \
        (var) = (tvar))

#undef HLTQ_FOREACH_REVERSE
#define HLTQ_FOREACH_REVERSE(var, head, headname, field) \
    for ((var) = HLTQ_LAST(head, headname); \
        (var) != HLTQ_END(head); \
        (var) = HLTQ_PREV(var, headname, field))

#undef HLTQ_FOREACH_REVERSE_SAFE
#define HLTQ_FOREACH_REVERSE_SAFE(var, head, headname, field, tvar) \
    for ((var) = HLTQ_LAST(head, headname); \
        (var) != HLTQ_END(head) && \
        ((tvar) = HLTQ_PREV(var, headname, field), 1); \
        (var) = (tvar))

/* Concatenate queue2 to the end of queue1. */
#undef HLTQ_CONCAT
#define HLTQ_CONCAT(queue1, queue2, field) do { \
    (queue2)->field.tqe_prev = (queue1)->field.tqe_prev; \
    *(queue1)->field.tqe_prev = (queue2); \
    (queue1)->field.tqe_prev = &(queue2)->field.tqe_next; \
} while (0)

/* Convert a headless tailq to a headful one. */
#define HLTQ_TO_TAILQ(head, hl, field) do { \
    (head)->tqh_first = (hl); \
    (head)->tqh_last = (hl)->field.tqe_prev; \
    (hl)->field.tqe_prev = &(head)->tqh_first; \
} while (0)

```



```

/* Concatenate a headless tail queue to the end of a regular tail queue. */
#define TAILQ_CONCAT_HLTQ(head, hl, field) do { \
    void *last = (hl)->field.tqe_prev; \
    (hl)->field.tqe_prev = (head)->tqh_last; \
    *(head)->tqh_last = (hl); \
    (head)->tqh_last = last; \
} while (0)

#endif /* !SUDO_QUEUE_H */
/* $OpenBSD: reallocarray.c,v 1.2 2014/12/08 03:45:00 bcook Exp $ */
/*
 * Copyright (c) 2008 Otto Moerbeek <otto@drijf.net>
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 * OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.
 */

#include <config.h>

#ifndef HAVE_REALLOCARRAY

#include <sys/types.h>
#include <stdlib.h>
#if defined(HAVE_STDINT_H)
# include <stdint.h>
#elif defined(HAVE_INTTYPES_H)
# include <inttypes.h>
#endif
#include <errno.h>
#include <limits.h>

#include "sudo_compat.h"

/*
 * This is sqrt(SIZE_MAX+1), as s1*s2 <= SIZE_MAX
 * if both s1 < MUL_NO_OVERFLOW and s2 < MUL_NO_OVERFLOW
 */
#define MUL_NO_OVERFLOW ((size_t)1 << (sizeof(size_t) * 4))

```

```

void *
sudo_reallocarray(void *optr, size_t nmemb, size_t size)
{
if ((nmemb >= MUL_NO_OVERFLOW || size >= MUL_NO_OVERFLOW) &&
    nmemb > 0 && SIZE_MAX / nmemb < size) {
    errno = ENOMEM;
    return NULL;
}
return realloc(optr, size * nmemb);
}

```

#endif /\* HAVE\_REALLOCARRAY \*/

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/\* \$OpenBSD: fnmatch.c,v 1.15 2011/02/10 21:31:59 stsp Exp \$ \*/

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\*

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\*/

/\* Authored by William A. Rowe Jr. <wrowe; apache.org, vmware.com>, April 2011

\*

\* Derived from The Open Group Base Specifications Issue 7, IEEE Std 1003.1-2008

\* as described in;

\* <http://pubs.opengroup.org/onlinepubs/9699919799/functions/fnmatch.html>

\*

\* Filename pattern matches defined in section 2.13, "Pattern Matching Notation"

\* from chapter 2. "Shell Command Language"

\* [http://pubs.opengroup.org/onlinepubs/9699919799/utilities/V3\\_chap02.html#tag\\_18\\_13](http://pubs.opengroup.org/onlinepubs/9699919799/utilities/V3_chap02.html#tag_18_13)

\* where; 1. A bracket expression starting with an unquoted <circumflex> '^'

\* character CONTINUES to specify a non-matching list; 2. an explicit <period> '.'

\* in a bracket expression matching list, e.g. "[.abc]" does NOT match a leading

\* <period> in a filename; 3. a <left-square-bracket> '[' which does not introduce

- \* a valid bracket expression is treated as an ordinary character; 4. a differing
- \* number of consecutive slashes within pattern and string will NOT match;
- \* 5. a trailing '\' in FNM\_ESCAPE mode is treated as an ordinary '\' character.
- \*
- \* Bracket expansion defined in section 9.3.5, "RE Bracket Expression",
- \* from chapter 9, "Regular Expressions"
- \* [http://pubs.opengroup.org/onlinepubs/9699919799/basedefs/V1\\_chap09.html#tag\\_09\\_03\\_05](http://pubs.opengroup.org/onlinepubs/9699919799/basedefs/V1_chap09.html#tag_09_03_05)
- \* with no support for collating symbols, equivalence class expressions or
- \* character class expressions. A partial range expression with a leading
- \* hyphen following a valid range expression will match only the ordinary
- \* <hyphen> and the ending character (e.g. "[a-m-z]" will match characters
- \* 'a' through 'm', a <hyphen> '-', or a 'z').
- \*
- \* Supports BSD extensions FNM\_LEADING\_DIR to match pattern to the end of one
- \* path segment of string, and FNM\_CASEFOLD to ignore alpha case.
- \*
- \* NOTE: Only POSIX/C single byte locales are correctly supported at this time.
- \* Notably, non-POSIX locales with FNM\_CASEFOLD produce undefined results,
- \* particularly in ranges of mixed case (e.g. "[A-z]") or spanning alpha and
- \* nonalpha characters within a range.
- \*
- \* XXX comments below indicate porting required for multi-byte character sets
- \* and non-POSIX locale collation orders; requires mbr\* APIs to track shift
- \* state of pattern and string (rewinding pattern and string repeatedly).
- \*
- \* Certain parts of the code assume 0x00-0x3F are unique with any MBCS (e.g.
- \* UTF-8, SHIFT-JIS, etc). Any implementation allowing '\' as an alternate
- \* path delimiter must be aware that 0x5C is NOT unique within SHIFT-JIS.
- \*/

```
#include <config.h>
```

```
#ifndef HAVE_FNMATCH
```

```
#include <sys/types.h>
```

```
#include <stdio.h>
```

```
#include <ctype.h>
```

```
#ifdef HAVE_STRING_H
```

```
# include <string.h>
```

```
#endif /* HAVE_STRING_H */
```

```
#ifdef HAVE_STRINGS_H
```

```
# include <strings.h>
```

```
#endif /* HAVE_STRINGS_H */
```

```
#include "sudo_compat.h"
```

```
#include "compat/charclass.h"
```

```
#include "compat/fnmatch.h"
```

```

#define RANGE_MATCH 1
#define RANGE_NOMATCH 0
#define RANGE_ERROR (-1)

static int
classmatch(const char *pattern, char test, int foldcase, const char **ep)
{
    const char * const mismatch = pattern;
    const char *colon;
    struct cclass *cc;
    int rval = RANGE_NOMATCH;
    size_t len;

    if (pattern[0] != '[' || pattern[1] != ':') {
        *ep = mismatch;
        return RANGE_ERROR;
    }
    pattern += 2;

    if ((colon = strchr(pattern, ':')) == NULL || colon[1] != ']') {
        *ep = mismatch;
        return RANGE_ERROR;
    }
    *ep = colon + 2;
    len = (size_t)(colon - pattern);

    if (foldcase && strncmp(pattern, "upper:]", 7) == 0)
        pattern = "lower:]";
    for (cc = cclasses; cc->name != NULL; cc++) {
        if (!strncmp(pattern, cc->name, len) && cc->name[len] == '\0') {
            if (cc->isctype((unsigned char)test))
                rval = RANGE_MATCH;
            break;
        }
    }
    if (cc->name == NULL) {
        /* invalid character class, treat as normal text */
        *ep = mismatch;
        rval = RANGE_ERROR;
    }
    return rval;
}

/* Most MBCS/collation/case issues handled here. Wildcard '*' is not handled.
 * EOS '\0' and the FNM_PATHNAME '/' delimiters are not advanced over,
 * however the "\v" sequence is advanced to '/'.
 */

```

```

* Both pattern and string are **char to support pointer increment of arbitrary
* multibyte characters for the given locale, in a later iteration of this code
*/
static int fnmatch_ch(const char **pattern, const char **string, int flags)
{
    const char * const mismatch = *pattern;
    const int nocase = !(flags & FNM_CASEFOLD);
    const int escape = !(flags & FNM_NOESCAPE);
    const int slash = !(flags & FNM_PATHNAME);
    int result = FNM_NOMATCH;
    const char *startch;
    int negate;

    if (**pattern == '[')
    {
        ++*pattern;

        /* Handle negation, either leading ! or ^ operators (never both) */
        negate = ((**pattern == '!') || (**pattern == '^'));
        if (negate)
            ++*pattern;

        /* ']' is an ordinary character at the start of the range pattern */
        if (**pattern == ']')
            goto leadingclosebrace;

        while (**pattern)
        {
            if (**pattern == ']') {
                ++*pattern;
                /* XXX: Fix for MBCS character width */
                ++*string;
                return (result ^ negate);
            }

            if (escape && (**pattern == '\\')) {
                ++*pattern;

                /* Patterns must be terminated with ']', not EOS */
                if (!**pattern)
                    break;
            }

            /* Patterns must be terminated with ']' not '/' */
            if (slash && (**pattern == '/')
                break;

            /* Match character classes. */

```

```

if (classmatch(*pattern, **string, nocase, pattern)
    == RANGE_MATCH) {
    result = 0;
    continue;
}

```

leadingclosebrace:

```

/* Look at only well-formed range patterns;
 * "x-]" is not allowed unless escaped ("x-\]")
 * XXX: Fix for locale/MBCS character width
 */
if (((*pattern)[1] == '-') && ((*pattern)[2] != ']'))
{
    startch = *pattern;
    *pattern += (escape && ((*pattern)[2] == '\\')) ? 3 : 2;

    /* NOT a properly balanced [expr] pattern, EOS terminated
     * or ranges containing a slash in FNM_PATHNAME mode pattern
     * fall out to to the rewind and test '[' literal code path
     */
    if (!**pattern || (slash && (**pattern == '/')))
        break;

    /* XXX: handle locale/MBCS comparison, advance by MBCS char width */
    if (**string >= *startch && (**string <= **pattern))
        result = 0;
    else if (nocase && (isupper((unsigned char)**string) ||
isupper((unsigned char)*startch) ||
isupper((unsigned char)**pattern))
        && (tolower((unsigned char)**string) >= tolower((unsigned char)*startch))
        && (tolower((unsigned char)**string) <= tolower((unsigned char)**pattern)))
        result = 0;

    ++*pattern;
    continue;
}

/* XXX: handle locale/MBCS comparison, advance by MBCS char width */
if (**string == **pattern)
    result = 0;
else if (nocase && (isupper((unsigned char)**string) ||
isupper((unsigned char)**pattern))
    && (tolower((unsigned char)**string) == tolower((unsigned char)**pattern)))
    result = 0;

    ++*pattern;
}

```

```

/* NOT a properly balanced [expr] pattern; Rewind
 * and reset result to test '[' literal
 */
*pattern = mismatch;
result = FNM_NOMATCH;
}
else if (**pattern == '?') {
    /* Optimize '?' match before unescaping **pattern */
    if (!**string || (slash && (**string == '/')))
        return FNM_NOMATCH;
    result = 0;
    goto fnmatch_ch_success;
}
else if (escape && (**pattern == '\\') && (*pattern)[1]) {
    ++*pattern;
}

/* XXX: handle locale/MBCS comparison, advance by the MBCS char width */
if (**string == **pattern)
    result = 0;
else if (nocase && (isupper((unsigned char)**string) || isupper((unsigned char)**pattern))
    && (tolower((unsigned char)**string) == tolower((unsigned char)**pattern)))
    result = 0;

/* Refuse to advance over trailing slash or nulls
 */
if (!**string || !**pattern || (slash && (**string == '/') || (**pattern == '/')))
    return result;

fnmatch_ch_success:
    ++*pattern;
    ++*string;
    return result;
}

int sudo_fnmatch(const char *pattern, const char *string, int flags)
{
    static const char dummystring[2] = {' ', 0};
    const int escape = !(flags & FNM_NOESCAPE);
    const int slash = !(flags & FNM_PATHNAME);
    const int leading_dir = !(flags & FNM_LEADING_DIR);
    const char *strendseg;
    const char *dummyptr;
    const char *matchptr;
    int wild;
    /* For '*' wild processing only; suppress 'used before initialization'
     * warnings with dummy initialization values;
     */

```



```

const char *strstartseg = NULL;
const char *mismatch = NULL;
int matchlen = 0;

if (*pattern == '*')
    goto firstsegment;

while (*pattern && *string)
{
    /* Pre-decode "\\" which has no special significance, and
    * match balanced slashes, starting a new segment pattern
    */
    if (slash && escape && (*pattern == '\\') && (pattern[1] == '/'))
        ++pattern;
    if (slash && (*pattern == '/') && (*string == '/')) {
        ++pattern;
        ++string;
    }
}

firstsegment:
    /* At the beginning of each segment, validate leading period behavior.
    */
    if ((flags & FNM_PERIOD) && (*string == '.'))
    {
        if (*pattern == '.')
            ++pattern;
        else if (escape && (*pattern == '\\') && (pattern[1] == '.'))
            pattern += 2;
        else
            return FNM_NOMATCH;
        ++string;
    }

    /* Determine the end of string segment
    *
    * Presumes '/' character is unique, not composite in any MBCS encoding
    */
    if (slash) {
        strendseg = strchr(string, '/');
        if (!strendseg)
            strendseg = strchr(string, '\0');
    }
    else {
        strendseg = strchr(string, '\0');
    }

    /* Allow pattern '*' to be consumed even with no remaining string to match
    */

```

```

while (*pattern)
{
    if ((string > strendseg)
        || ((string == strendseg) && (*pattern != '*')))
        break;

    if (slash && ((*pattern == '/')
        || (escape && (*pattern == "\\")
            && (pattern[1] == '/))))
        break;

    /* Reduce groups of '*' and '?' to n '?' matches
     * followed by one '*' test for simplicity
     */
    for (wild = 0; ((*pattern == '*') || (*pattern == '?')); ++pattern)
    {
        if (*pattern == '*') {
            wild = 1;
        }
        else if (string < strendseg) { /* && (*pattern == '?') */
            /* XXX: Advance 1 char for MBCS locale */
            ++string;
        }
        else { /* (string >= strendseg) && (*pattern == '?') */
            return FNM_NOMATCH;
        }
    }

    if (wild)
    {
        strstartseg = string;
        mismatch = pattern;

        /* Count fixed (non '*') char matches remaining in pattern
         * excluding '/' (or "\") and '*'
         */
        for (matchptr = pattern, matchlen = 0; 1; ++matchlen)
        {
            if ((*matchptr == '\0')
                || (slash && (*matchptr == '/')
                    || (escape && (*matchptr == "\\")
                        && (matchptr[1] == '/))))
            {
                /* Compare precisely this many trailing string chars,
                 * the resulting match needs no wildcard loop
                 */
                /* XXX: Adjust for MBCS */
                if (string + matchlen > strendseg)

```

```

        return FNM_NOMATCH;

        string = strendseg - matchlen;
        wild = 0;
        break;
    }

    if (*matchptr == '*')
    {
        /* Ensure at least this many trailing string chars remain
         * for the first comparison
         */
        /* XXX: Adjust for MBCS */
        if (string + matchlen > strendseg)
            return FNM_NOMATCH;

        /* Begin first wild comparison at the current position */
        break;
    }

    /* Skip forward in pattern by a single character match
     * Use a dummy fnmatch_ch() test to count one "[range]" escape
     */
    /* XXX: Adjust for MBCS */
    if (escape && (*matchptr == '\\') && matchptr[1]) {
        matchptr += 2;
    }
    else if (*matchptr == '[') {
        dummyptr = dummystring;
        fnmatch_ch(&matchptr, &dummyptr, flags);
    }
    else {
        ++matchptr;
    }
}

/* Incrementally match string against the pattern
 */
while (*pattern && (string < strendseg))
{
    /* Success; begin a new wild pattern search
     */
    if (*pattern == '*')
        break;

    if (slash && ((*string == '/')
        || (*pattern == '/'))

```

```

        || (escape && (*pattern == '\\')
            && (pattern[1] == '/))))
    break;

/* Compare ch's (the pattern is advanced over "\\" to the '/',
 * but slashes will mismatch, and are not consumed)
 */
if (!fnmatch_ch(&pattern, &string, flags))
    continue;

/* Failed to match, loop against next char offset of string segment
 * until not enough string chars remain to match the fixed pattern
 */
if (wild) {
    /* XXX: Advance 1 char for MBCS locale */
    string = ++strstartseg;
    if (string + matchlen > strendseg)
        return FNM_NOMATCH;

    pattern = mismatch;
    continue;
}
else
    return FNM_NOMATCH;
}
}

if (*string && !(slash || leading_dir) && (*string == '/'))
    return FNM_NOMATCH;

if (*pattern && !(slash && ((*pattern == '/')
    || (escape && (*pattern == '\\')
        && (pattern[1] == '/))))))
    return FNM_NOMATCH;

if (leading_dir && !*pattern && *string == '/')
    return 0;
}

/* Where both pattern and string are at EOS, declare success
 */
if (!*string && !*pattern)
    return 0;

/* pattern didn't match to the end of string */
return FNM_NOMATCH;
}
#endif /* HAVE_FNMATCH */

```

```

/* $OpenBSD: vfprintf.c,v 1.67 2014/12/21 00:23:30 daniel Exp $ */
/*-
 * Copyright (c) 1999-2005, 2008, 2010-2015
 *   Todd C. Miller <Todd.Miller@courtesan.com>
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 *
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 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
 * SUCH DAMAGE.
 *
 * From: @(#)vfprintf.c 8.1 (Berkeley) 6/4/93
 */

/*
 * v?snprintf/v?asprintf based on OpenBSD vfprintf.c.
 */

#include <config.h>

#if !defined(HAVE_VSNPRINTF) || !defined(HAVE_SNPRINTF) || \
    !defined(HAVE_VASPRINTF) || !defined(HAVE_ASPRINTF) || \
    defined(PREFER_PORTABLE_SNPRINTF)

#include <sys/types.h>

```

```

#include <sys/mman.h>

#include <errno.h>
#ifdef HAVE_NL_LANGINFO
# include <langinfo.h>
#endif
#include <limits.h>
#include <stdarg.h>
#include <stdlib.h>
#include <stddef.h>
#if defined(HAVE_STDINT_H)
# include <stdint.h>
#elif defined(HAVE_INTTYPES_H)
# include <inttypes.h>
#endif
#include <stdio.h>
#ifdef HAVE_STRING_H
# include <string.h>
#endif /* HAVE_STRING_H */
#ifdef HAVE_STRINGS_H
# include <strings.h>
#endif /* HAVE_STRINGS_H */
#include <unistd.h>
#ifdef PRINTF_WIDE_CHAR
# include <wchar.h>
#endif
#include <fcntl.h>

#include "sudo_compat.h"

/* Avoid printf format attacks by ignoring the %n escape. */
#define NO_PRINTF_PERCENT_N

union arg {
int intarg;
unsigned int uintarg;
long longarg;
unsigned long ulongarg;
long long longlongarg;
unsigned long long ulonglongarg;
ptrdiff_t ptrdiffarg;
size_t sizearg;
ssize_t ssizearg;
intmax_t intmaxarg;
uintmax_t uintmaxarg;
void *pvoidarg;
char *pchararg;
signed char *pschararg;

```

```

short *pshortarg;
int *pintarg;
long *plongarg;
long long *plonglongarg;
ptrdiff_t *pptrdiffarg;
ssize_t *pssizearg;
intmax_t *pintmaxarg;
#ifdef FLOATING_POINT
double doublearg;
long double longdoublearg;
#endif
#ifdef PRINTF_WIDE_CHAR
wint_t wintarg;
wchar_t *pwchararg;
#endif
};

static int __find_arguments(const char *fmt0, va_list ap, union arg **argtable,
    size_t *argtablesiz);
static int __grow_type_table(unsigned char **typetable, int *tablesiz);
static int xxxprintf(char **, size_t, int, const char *, va_list);

#if !defined(MAP_ANON) && defined(MAP_ANONYMOUS)
# define MAP_ANON MAP_ANONYMOUS
#endif

/*
 * Allocate "size" bytes via mmap.
 */
static void *
mmap_alloc(size_t size)
{
    void *p;
#ifdef MAP_ANON
    int fd;

    if ((fd = open("/dev/zero", O_RDWR)) == -1)
        return NULL;
    p = mmap(NULL, size, PROT_READ | PROT_WRITE, MAP_PRIVATE, fd, 0);
    close(fd);
#else
    p = mmap(NULL, size, PROT_READ | PROT_WRITE, MAP_PRIVATE|MAP_ANON, -1, 0);
#endif
    if (p == MAP_FAILED)
        return NULL;
    return p;
}

```

```

/*
 * Unmap "size" bytes of the ptr.
 */
static void
mmap_free(void *ptr, size_t size)
{
    if (ptr != NULL)
        munmap(ptr, size);
}

#ifdef PRINTF_WIDE_CHAR
/*
 * Convert a wide character string argument for the %ls format to a multibyte
 * string representation. If not -1, prec specifies the maximum number of
 * bytes to output, and also means that we can't assume that the wide char
 * string is null-terminated.
 */
static char *
__wconv(wchar_t *wcsarg, int prec)
{
    mbstate_t mbs;
    char buf[MB_LEN_MAX];
    wchar_t *p;
    char *convbuf;
    size_t clen, nbytes;

    /* Allocate space for the maximum number of bytes we could output. */
    if (prec < 0) {
        memset(&mbs, 0, sizeof(mbs));
        p = wcsarg;
        nbytes = wcsrtombs(NULL, (const wchar_t **)&p, 0, &mbs);
        if (nbytes == (size_t)-1) {
            errno = EILSEQ;
            return NULL;
        }
    } else {
        /*
         * Optimisation: if the output precision is small enough,
         * just allocate enough memory for the maximum instead of
         * scanning the string.
         */
        if (prec < 128)
            nbytes = prec;
        else {
            nbytes = 0;
            p = wcsarg;
            memset(&mbs, 0, sizeof(mbs));
            for (;) {

```



```

    clen = wcrctomb(buf, *p++, &mbs);
    if (clen == 0 || clen == (size_t)-1 ||
        nbytes + clen > (size_t)prec)
        break;
    nbytes += clen;
}
if (clen == (size_t)-1) {
    errno = EILSEQ;
    return NULL;
}
}
}
if ((convbuf = malloc(nbytes + 1)) == NULL)
    return NULL;

/* Fill the output buffer. */
p = wcsarg;
memset(&mbs, 0, sizeof(mbs));
if ((nbytes = wcsrtombs(convbuf, (const wchar_t **)&p,
    nbytes, &mbs)) == (size_t)-1) {
    free(convbuf);
    errno = EILSEQ;
    return NULL;
}
convbuf[nbytes] = '\0';
return convbuf;
}
#endif

#ifdef FLOATING_POINT
#include <float.h>
#include <locale.h>
#include <math.h>
#include "floatio.h"
#include "gdtoa.h"

#define DEFPREC 6

static int exponent(char *, int, int);
#endif /* FLOATING_POINT */

/*
 * The size of the buffer we use as scratch space for integer
 * conversions, among other things. Technically, we would need the
 * most space for base 10 conversions with thousands' grouping
 * characters between each pair of digits. 100 bytes is a
 * conservative overestimate even for a 128-bit uintmax_t.
 */

```

```

#define BUF 100

#define STATIC_ARG_TBL_SIZE 8 /* Size of static argument table. */

/*
 * Macros for converting digits to letters and vice versa
 */
#define to_digit(c) ((c) - '0')
#define is_digit(c) ((unsigned int)to_digit(c) <= 9)
#define to_char(n) ((n) + '0')

/*
 * Flags used during conversion.
 */
#define ALT 0x0001 /* alternate form */
#define LADJUST 0x0004 /* left adjustment */
#define LONGDBL 0x0008 /* long double */
#define LONGINT 0x0010 /* long integer */
#define LLONGINT 0x0020 /* long long integer */
#define SHORTINT 0x0040 /* short integer */
#define ZEROPAD 0x0080 /* zero (as opposed to blank) pad */
#define FPT 0x0100 /* Floating point number */
#define PTRINT 0x0200 /* (unsigned) ptrdiff_t */
#define SIZEINT 0x0400 /* (signed) size_t */
#define CHARINT 0x0800 /* 8 bit integer */
#undef MAXINT /* Also defined by HP-UX param.h... */
#define MAXINT 0x1000 /* largest integer size (intmax_t) */

/*
 * Actual printf innards.
 */
static int
xxxprintf(char **strp, size_t strsize, int alloc, const char *fmt0, va_list ap)
{
    char *fmt; /* format string */
    int ch; /* character from fmt */
    int n, n2; /* handy integers (short term usage) */
    char *cp; /* handy char pointer (short term usage) */
    int flags; /* flags as above */
    int ret; /* return value accumulator */
    int width; /* width from format (%8d), or 0 */
    int prec; /* precision from format; <0 for N/A */
    char sign; /* sign prefix (' ', '+', '-', or \0) */
#ifdef FLOATING_POINT
    /*
     * We can decompose the printed representation of floating
     * point numbers into several parts, some of which may be empty:

```

```

*
* [+|-] [0x|0X] MMM . NNN [e|E|p|P] [+|-] ZZ
*   A   B   ---C---   D   E   F
*
* A: 'sign' holds this value if present; '\0' otherwise
* B: ox[1] holds the 'x' or 'X'; '\0' if not hexadecimal
* C: cp points to the string MMMNNN. Leading and trailing
* zeros are not in the string and must be added.
* D: expchar holds this character; '\0' if no exponent, e.g. %f
* F: at least two digits for decimal, at least one digit for hex
*/
#ifdef HAVE_NL_LANGINFO
const char *decimal_point = NULL;
#else
const char *decimal_point = ".";
#endif
int signflag; /* true if float is negative */
union { /* floating point arguments %[aAeEfFgG] */
double dbl;
long double ldbl;
} fparg;
int expt; /* integer value of exponent */
char expchar; /* exponent character: [eEpP\0] */
char *dtoaend; /* pointer to end of converted digits */
int expsize; /* character count for expstr */
int lead; /* sig figs before decimal or group sep */
int ndig; /* actual number of digits returned by dtoa */
char expstr[MAXEXPDIG+2]; /* buffer for exponent string: e+ZZZ */
char *dtoaresult = NULL;
#endif

uintmax_t _umax; /* integer arguments %[diouxX] */
enum { OCT, DEC, HEX } base; /* base for %[diouxX] conversion */
int dprec; /* a copy of prec if %[diouxX], 0 otherwise */
int realsz; /* field size expanded by dprec */
int size; /* size of converted field or string */
const char *xdigs = ""; /* digits for %[xX] conversion */
#define NIOV 8
char buf[BUF]; /* buffer with space for digits of uintmax_t */
char ox[2]; /* space for 0x; ox[1] is either x, X, or \0 */
char *str; /* pointer to string to fill */
char *estr; /* pointer to last char in str */
union arg *argtable; /* args, built due to positional arg */
union arg statargtable[STATIC_ARG_TBL_SIZE];
size_t argtablesiz;
int nextarg; /* 1-based argument index */
va_list orgap; /* original argument pointer */
#ifdef PRINTF_WIDE_CHAR

```

```

char *convbuf; /* buffer for wide to multi-byte conversion */
#endif

/*
 * Choose PADSIZe to trade efficiency vs. size. If larger printf
 * fields occur frequently, increase PADSIZe and make the initialisers
 * below longer.
 */
#define PADSIZe 16 /* pad chunk size */
static char blanks[PADSIZe] =
    {' ',' ',' ',' ',' ',' ',' ',' ',' ',' ',' ',' ',' ',' ',' ',' '};
static char zeroes[PADSIZe] =
    {'0','0','0','0','0','0','0','0','0','0','0','0','0','0','0','0'};

static const char xdigs_lower[16] = "0123456789abcdef";
static const char xdigs_upper[16] = "0123456789ABCDEF";

/* Print chars to "str", (allocate as needed if alloc is set). */
#define PRINT(ptr, len) do { \
    const char *p = ptr; \
    const char *endp = ptr + len; \
    while (p < endp && (str < estr || alloc)) { \
        if (alloc && str >= estr) { \
            char *t; \
            ssize = (ssize << 1) + 1; \
            if (!(t = realloc(*strp, ssize))) { \
                free(str); \
                *strp = NULL; \
                ret = -1; \
                goto done; \
            } \
            str = t + (str - *strp); \
            estr = t + ssize - 1; \
            *strp = t; \
        } \
        *str++ = *p++; \
    } \
} while (0)

/* BEWARE, PAD uses `n' and PRINTANDPAD uses `n2'. */
#define PAD(plen, pstr) do { \
    if ((n = (plen)) > 0) { \
        while (n > PADSIZe) { \
            PRINT(pstr, PADSIZe); \
            n -= PADSIZe; \
        } \
        PRINT(pstr, n); \
    } \
}

```

```

} while (0)
#define PRINTANDPAD(p, ep, len, with) do { \
n2 = (ep) - (p); \
if (n2 > (len)) \
n2 = (len); \
if (n2 > 0) \
PRINT((p), n2); \
PAD((len) - (n2 > 0 ? n2 : 0), (with)); \
} while(0)

/*
 * To extend shorts properly, we need both signed and unsigned
 * argument extraction methods.
 */
#define SARG() \
((intmax_t)(flags&MAXINT ? GETARG(intmax_t) : \
flags&LLONGINT ? GETARG(long long) : \
flags&LONGINT ? GETARG(long) : \
flags&PTRINT ? GETARG(ptrdiff_t) : \
flags&SIZEINT ? GETARG(ssize_t) : \
flags&SHORTINT ? (short)GETARG(int) : \
flags&CHARINT ? (signed char)GETARG(int) : \
GETARG(int)))
#define UARG() \
((uintmax_t)(flags&MAXINT ? GETARG(uintmax_t) : \
flags&LLONGINT ? GETARG(unsigned long long) : \
flags&LONGINT ? GETARG(unsigned long) : \
flags&PTRINT ? (uintptr_t)GETARG(ptrdiff_t) /* XXX */ \
flags&SIZEINT ? GETARG(size_t) : \
flags&SHORTINT ? (unsigned short)GETARG(int) : \
flags&CHARINT ? (unsigned char)GETARG(int) : \
GETARG(unsigned int)))

/*
 * Append a digit to a value and check for overflow.
 */
#define APPEND_DIGIT(val, dig) do { \
if ((val) > INT_MAX / 10) \
goto overflow; \
(val) *= 10; \
if ((val) > INT_MAX - to_digit((dig))) \
goto overflow; \
(val) += to_digit((dig)); \
} while (0)

/*
 * Get * arguments, including the form *nn$. Preserve the nextarg
 * that the argument can be gotten once the type is determined.

```

```

    */
#define GETASTER(val) \
n2 = 0; \
cp = fmt; \
while (is_digit(*cp)) { \
    APPEND_DIGIT(n2, *cp); \
    cp++; \
} \
if (*cp == '$') { \
    int hold = nextarg; \
    if (argtable == NULL) { \
        argtable = statargtable; \
        __find_arguments(fmt0, orgap, &argtable, &argtablesiz); \
    } \
    nextarg = n2; \
    val = GETARG(int); \
    nextarg = hold; \
    fmt = ++cp; \
} else { \
    val = GETARG(int); \
}

/*
* Get the argument indexed by nextarg.  If the argument table is
* built, use it to get the argument.  If its not, get the next
* argument (and arguments must be gotten sequentially).
*/
#define GETARG(type) \
((argtable != NULL) ? *((type*)&argtable[nextarg++]) : \
(nextarg++, va_arg(ap, type)))

fmt = (char *)fmt0;
argtable = NULL;
nextarg = 1;
va_copy(orgap, ap);
ret = 0;
#ifdef PRINTF_WIDE_CHAR
convbuf = NULL;
#endif

if (alloc) {
    strsize = 128;
    *strp = str = malloc(strsize);
    if (str == NULL) {
        ret = -1;
        goto done;
    }
}
estr = str + 127;

```

```

} else {
    str = *strp;
    if (strsize)
        estr = str + strsize - 1;
    else
        estr = NULL;
}

/*
 * Scan the format for conversions (^%' character).
 */
for (;;) {
    for (cp = fmt; (ch = *fmt) != '\0' && ch != '%'; fmt++)
        /* void */;
    if ((n = fmt - cp) != 0) {
        if (n > INT_MAX - ret)
            goto overflow;
        PRINT(cp, n);
        ret += n;
    }
    if (ch == '\0')
        goto done;
    fmt++; /* skip over '%' */

    flags = 0;
    dprec = 0;
    width = 0;
    prec = -1;
    sign = '\0';
    ox[1] = '\0';

rflag: ch = *fmt++;
reswitch: switch (ch) {
    case ' ':
        /*
         * ``If the space and + flags both appear, the space
         * flag will be ignored.''
         * -- ANSI X3J11
         */
        if (!sign)
            sign = ' ';
        goto rflag;
    case '#':
        flags |= ALT;
        goto rflag;
    case '\\':
        /* grouping not implemented */
        goto rflag;

```

```

case '*':
/*
 * ``A negative field width argument is taken as a
 * - flag followed by a positive field width."
 * -- ANSI X3J11
 * They don't exclude field widths read from args.
 */
GETASTER(width);
if (width >= 0)
    goto rflag;
if (width == INT_MIN)
    goto overflow;
width = -width;
/* FALLTHROUGH */
case '-':
    flags |= LADJUST;
    goto rflag;
case '+':
    sign = '+';
    goto rflag;
case '!':
    if ((ch = *fmt++) == '*') {
        GETASTER(n);
        prec = n < 0 ? -1 : n;
        goto rflag;
    }
    n = 0;
    while (is_digit(ch)) {
        APPEND_DIGIT(n, ch);
        ch = *fmt++;
    }
    if (ch == '$') {
        nextarg = n;
        if (argtable == NULL) {
            argtable = statargtable;
            __find_arguments(fmt0, orgap,
                &argtable, &argtablesiz);
        }
        goto rflag;
    }
    prec = n;
    goto reswitch;
case '0':
/*
 * ``Note that 0 is taken as a flag, not as the
 * beginning of a field width."
 * -- ANSI X3J11
 */

```



```

flags |= ZEROPAD;
goto rflag;
case '1': case '2': case '3': case '4':
case '5': case '6': case '7': case '8': case '9':
n = 0;
do {
    APPEND_DIGIT(n, ch);
    ch = *fmt++;
} while (is_digit(ch));
if (ch == '$') {
    nextarg = n;
    if (argtable == NULL) {
        argtable = statargtable;
        __find_arguments(fmt0, orgap,
            &argtable, &argtablesiz);
    }
    goto rflag;
}
width = n;
goto reswitch;
#ifdef FLOATING_POINT
case 'L':
    flags |= LONGDBL;
    goto rflag;
#endif
case 'h':
    if (*fmt == 'h') {
        fmt++;
        flags |= CHARINT;
    } else {
        flags |= SHORTINT;
    }
    goto rflag;
case 'j':
    flags |= MAXINT;
    goto rflag;
case 'l':
    if (*fmt == 'l') {
        fmt++;
        flags |= LLONGINT;
    } else {
        flags |= LONGINT;
    }
    goto rflag;
case 'q':
    flags |= LLONGINT;
    goto rflag;
case 't':

```

```

    flags |= PTRINT;
    goto rflag;
case 'z':
    flags |= SIZEINT;
    goto rflag;
case 'c':
#ifdef PRINTF_WIDE_CHAR
    if (flags & LONGINT) {
        mbstate_t mbs;
        size_t mbseqlen;

        memset(&mbs, 0, sizeof(mbs));
        mbseqlen = wctomb(buf,
            (wchar_t)GETARG(wint_t), &mbs);
        if (mbseqlen == (size_t)-1) {
            errno = EILSEQ;
            goto done;
        }
        cp = buf;
        size = (int)mbseqlen;
    } else {
#endif
        *(cp = buf) = GETARG(int);
        size = 1;
#ifdef PRINTF_WIDE_CHAR
    }
#endif
    sign = '\0';
    break;
case 'D':
    flags |= LONGINT;
    /*FALLTHROUGH*/
case 'd':
case 'i':
    _umax = SARG();
    if ((intmax_t)_umax < 0) {
        _umax = -_umax;
        sign = '-';
    }
    base = DEC;
    goto number;
#ifdef FLOATING_POINT
case 'a':
case 'A':
    if (ch == 'a') {
        ox[1] = 'x';
        xdigs = xdigs_lower;
        expchar = 'p';

```

```

} else {
    ox[1] = 'X';
    xdigs = xdigs_upper;
    expchar = 'P';
}
if (prec >= 0)
    prec++;
if (dtoaresult)
    __freedtoa(dtoaresult);
if (flags & LONGDBL) {
    fparg.ldbl = GETARG(long double);
    dtoaresult = cp =
        __hldtoa(fparg.ldbl, xdigs, prec,
            &expt, &signflag, &dtoaend);
    if (dtoaresult == NULL) {
        errno = ENOMEM;
        goto done;
    }
} else {
    fparg.dbl = GETARG(double);
    dtoaresult = cp =
        __hdtoa(fparg.dbl, xdigs, prec,
            &expt, &signflag, &dtoaend);
    if (dtoaresult == NULL) {
        errno = ENOMEM;
        goto done;
    }
}
if (prec < 0)
    prec = dtoaend - cp;
if (expt == INT_MAX)
    ox[1] = '\0';
goto fp_common;
case 'e':
case 'E':
    expchar = ch;
    if (prec < 0) /* account for digit before decpt */
        prec = DEFPPREC + 1;
    else
        prec++;
    goto fp_begin;
case 'f':
case 'F':
    expchar = '\0';
    goto fp_begin;
case 'g':
case 'G':
    expchar = ch - ('g' - 'e');

```

```

if (prec == 0)
    prec = 1;
fp_begin:
if (prec < 0)
    prec = DEFPREC;
if (dtoaresult)
    __freedtoa(dtoaresult);
if (flags & LONGDBL) {
    fparg.ldbl = GETARG(long double);
    dtoaresult = cp =
        __ldtoa(&fparg.ldbl, expchar ? 2 : 3, prec,
            &expt, &signflag, &dtoaend);
if (dtoaresult == NULL) {
    errno = ENOMEM;
    goto done;
}
} else {
    fparg.dbl = GETARG(double);
    dtoaresult = cp =
        __dtoa(fparg.dbl, expchar ? 2 : 3, prec,
            &expt, &signflag, &dtoaend);
if (dtoaresult == NULL) {
    errno = ENOMEM;
    goto done;
}
}
if (expt == 9999)
    expt = INT_MAX;
}
fp_common:
if (signflag)
    sign = '-';
if (expt == INT_MAX) { /* inf or nan */
if (*cp == 'N')
    cp = (ch >= 'a') ? "nan" : "NAN";
else
    cp = (ch >= 'a') ? "inf" : "INF";
size = 3;
flags &= ~ZEROPAD;
break;
}
flags |= FPT;
ndig = dtoaend - cp;
if (ch == 'g' || ch == 'G') {
if (expt > -4 && expt <= prec) {
    /* Make %[gG] smell like %[fF] */
    expchar = '\0';
if (flags & ALT)
    prec -= expt;
}
}

```

```

else
    prec = ndig - expt;
if (prec < 0)
    prec = 0;
} else {
/*
 * Make %[gG] smell like %[eE], but
 * trim trailing zeroes if no # flag.
 */
if (!(flags & ALT))
    prec = ndig;
}
}
if (expchar) {
    expsize = exponent(expstr, expt - 1, expchar);
    size = expsize + prec;
if (prec > 1 || flags & ALT)
    ++size;
} else {
/* space for digits before decimal point */
if (expt > 0)
    size = expt;
else /* "0" */
    size = 1;
/* space for decimal pt and following digits */
if (prec || flags & ALT)
    size += prec + 1;
lead = expt;
}
break;
#endif /* FLOATING_POINT */
#ifndef NO_PRINTF_PERCENT_N
case 'n':
if (flags & LLONGINT)
    *GETARG(long long *) = ret;
else if (flags & LONGINT)
    *GETARG(long *) = ret;
else if (flags & SHORTINT)
    *GETARG(short *) = ret;
else if (flags & CHARINT)
    *GETARG(signed char *) = ret;
else if (flags & PTRINT)
    *GETARG(ptrdiff_t *) = ret;
else if (flags & SIZEINT)
    *GETARG(ssize_t *) = ret;
else if (flags & MAXINT)
    *GETARG(intmax_t *) = ret;
else

```

```

    *GETARG(int *) = ret;
    continue; /* no output */
#endif /* NO_PRINTF_PERCENT_N */
case 'O':
    flags |= LONGINT;
    /*FALLTHROUGH*/
case 'o':
    _umax = UARG();
    base = OCT;
    goto nosign;
case 'p':
    /*
     * ``The argument shall be a pointer to void. The
     * value of the pointer is converted to a sequence
     * of printable characters, in an implementation-
     * defined manner.''
     * -- ANSI X3J11
     */
    /* NOSTRICT */
    _umax = (u_long)GETARG(void *);
    base = HEX;
    xdigs = xdigs_lower;
    ox[1] = 'x';
    goto nosign;
case 's':
#ifdef PRINTF_WIDE_CHAR
    if (flags & LONGINT) {
        wchar_t *wcp;

        if (convbuf != NULL) {
            free(convbuf);
            convbuf = NULL;
        }
        if ((wcp = GETARG(wchar_t *)) == NULL) {
            cp = "(null)";
        } else {
            convbuf = __wcsconv(wcp, prec);
            if (convbuf == NULL)
                goto done;
            cp = convbuf;
        }
    } else
#endif
#ifdef PRINTF_WIDE_CHAR /*
    if ((cp = GETARG(char *)) == NULL)
        cp = "(null)";
    if (prec >= 0) {
        /*
         * can't use strlen; can only look for the

```

```

* NUL in the first `prec' characters, and
* strlen() will go further.
*/
char *p = memchr(cp, 0, prec);

size = p ? (p - cp) : prec;
} else {
size_t len;

if ((len = strlen(cp)) > INT_MAX)
goto overflow;
size = (int)len;
}
sign = '\0';
break;
case 'U':
flags |= LONGINT;
/*FALLTHROUGH*/
case 'u':
_uamax = UARG();
base = DEC;
goto nosign;
case 'X':
xdigs = xdigs_upper;
goto hex;
case 'x':
xdigs = xdigs_lower;
hex: _uamax = UARG();
base = HEX;
/* leading 0x/X only if non-zero */
if (flags & ALT && _uamax != 0)
ox[1] = ch;

/* unsigned conversions */
nosign: sign = '\0';
/*
* ``... diouXx conversions ... if a precision is
* specified, the 0 flag will be ignored."
* -- ANSI X3J11
*/
number: if ((dprec = prec) >= 0)
flags &= ~ZEROPAD;

/*
* ``The result of converting a zero value with an
* explicit precision of zero is no characters."
* -- ANSI X3J11
*/

```

```

cp = buf + BUF;
if (_umax != 0 || prec != 0) {
/*
 * Unsigned mod is hard, and unsigned mod
 * by a constant is easier than that by
 * a variable; hence this switch.
 */
switch (base) {
case OCT:
do {
*--cp = to_char(_umax & 7);
_umax >>= 3;
} while (_umax);
/* handle octal leading 0 */
if (flags & ALT && *cp != '0')
*--cp = '0';
break;

case DEC:
/* many numbers are 1 digit */
while (_umax >= 10) {
*--cp = to_char(_umax % 10);
_umax /= 10;
}
*--cp = to_char(_umax);
break;

case HEX:
do {
*--cp = xdigs[_umax & 15];
_umax >>= 4;
} while (_umax);
break;

default:
cp = "bug in vfprintf: bad base";
size = strlen(cp);
goto skipsize;
}
}
size = buf + BUF - cp;
if (size > BUF) /* should never happen */
abort();
skipsize:
break;
default: /* "%?" prints ?, unless ? is NUL */
if (ch == '\0')
goto done;

```



```

/* pretend it was %c with argument ch */
cp = buf;
*cp = ch;
size = 1;
sign = '\0';
break;
}

/*
 * All reasonable formats wind up here. At this point, `cp'
 * points to a string which (if not flags&LADJUST) should be
 * padded out to `width' places. If flags&ZEROPAD, it should
 * first be prefixed by any sign or other prefix; otherwise,
 * it should be blank padded before the prefix is emitted.
 * After any left-hand padding and prefixing, emit zeroes
 * required by a decimal %[diouxX] precision, then print the
 * string proper, then emit zeroes required by any leftover
 * floating precision; finally, if LADJUST, pad with blanks.
 *
 * Compute actual size, so we know how much to pad.
 * size excludes decimal prec; realsz includes it.
 */
realsz = dprec > size ? dprec : size;
if (sign)
    realsz++;
if (ox[1])
    realsz+= 2;

/* right-adjusting blank padding */
if ((flags & (LADJUST|ZEROPAD)) == 0)
    PAD(width - realsz, blanks);

/* prefix */
if (sign)
    PRINT(&sign, 1);
if (ox[1]) { /* ox[1] is either x, X, or \0 */
    ox[0] = '0';
    PRINT(ox, 2);
}

/* right-adjusting zero padding */
if ((flags & (LADJUST|ZEROPAD)) == ZEROPAD)
    PAD(width - realsz, zeroes);

/* leading zeroes from decimal precision */
PAD(dprec - size, zeroes);

/* the string or number proper */

```

```

#ifdef FLOATING_POINT
    if ((flags & FPT) == 0) {
        PRINT(cp, size);
    } else { /* glue together f_p fragments */
#ifdef HAVE_NL_LANGINFO
        if (decimal_point == NULL)
            decimal_point = nl_langinfo(RADIXCHAR);
#endif
        if (!expchar) { /* %[fF] or sufficiently short %[gG] */
            if (expt <= 0) {
                PRINT(zeroes, 1);
                if (prec || flags & ALT)
                    PRINT(decimal_point, 1);
                PAD(-expt, zeroes);
                /* already handled initial 0's */
                prec += expt;
            } else {
                PRINTANDPAD(cp, dtoaend, lead, zeroes);
                cp += lead;
                if (prec || flags & ALT)
                    PRINT(decimal_point, 1);
            }
            PRINTANDPAD(cp, dtoaend, prec, zeroes);
        } else { /* %[eE] or sufficiently long %[gG] */
            if (prec > 1 || flags & ALT) {
                buf[0] = *cp++;
                buf[1] = *decimal_point;
                PRINT(buf, 2);
                PRINT(cp, ndig-1);
                PAD(prec - ndig, zeroes);
            } else { /* XeYYY */
                PRINT(cp, 1);
            }
            PRINT(expstr, expsize);
        }
    }
#else
    PRINT(cp, size);
#endif
    /* left-adjusting padding (always blank) */
    if (flags & LADJUST)
        PAD(width - realsz, blanks);

    /* finally, adjust ret */
    if (width < realsz)
        width = realsz;
    if (width > INT_MAX - ret)
        goto overflow;

```

```

    ret += width;
}
done:
va_end(orgap);
if (strsize)
    *str = '\0';
goto finish;

overflow:
errno = ENOMEM;
ret = -1;

finish:
#ifdef PRINTF_WIDE_CHAR
    if (convbuf)
        free(convbuf);
#endif
#ifdef FLOATING_POINT
    if (dtoaresult)
        __freedtoa(dtoaresult);
#endif
    if (argtable != NULL && argtable != statargtable) {
        mmap_free(argtable, argtablesiz);
        argtable = NULL;
    }
    return ret;
}

/*
 * Type ids for argument type table.
 */
#define T_UNUSED 0
#define T_SHORT 1
#define T_U_SHORT 2
#define TP_SHORT 3
#define T_INT 4
#define T_U_INT 5
#define TP_INT 6
#define T_LONG 7
#define T_U_LONG 8
#define TP_LONG 9
#define T_LLONG 10
#define T_U_LLONG 11
#define TP_LLONG 12
#define T_DOUBLE 13
#define T_LONG_DOUBLE 14
#define TP_CHAR 15
#define TP_VOID 16

```

```

#define T_PTRINT 17
#define TP_PTRINT 18
#define T_SIZEINT 19
#define T_SSIZEINT 20
#define TP_SSIZEINT 21
#define T_MAXINT 22
#define T_MAXUINT 23
#define TP_MAXINT 24
#define T_CHAR 25
#define T_U_CHAR 26
#define T_WINT 27
#define TP_WCHAR 28

/*
 * Find all arguments when a positional parameter is encountered. Returns a
 * table, indexed by argument number, of pointers to each arguments. The
 * initial argument table should be an array of STATIC_ARG_TBL_SIZE entries.
 * It will be replaced with a mmap-ed one if it overflows (malloc cannot be
 * used since we are attempting to make snprintf thread safe, and alloca is
 * problematic since we have nested functions..)
 */
static int
__find_arguments(const char *fmt0, va_list ap, union arg **argtable,
                size_t *argtablesize)
{
    char *fmt; /* format string */
    int ch; /* character from fmt */
    int n, n2; /* handy integer (short term usage) */
    char *cp; /* handy char pointer (short term usage) */
    int flags; /* flags as above */
    unsigned char *typetable; /* table of types */
    unsigned char stattypetable[STATIC_ARG_TBL_SIZE];
    int tablesize; /* current size of type table */
    int tablemax; /* largest used index in table */
    int nextarg; /* 1-based argument index */
    int ret = 0; /* return value */

    /*
     * Add an argument type to the table, expanding if necessary.
     */
#define ADDTYPE(type) \
    ((nextarg >= tablesize) ? \
     __grow_type_table(&typetable, &tablesize) : 0, \
    (nextarg > tablemax) ? tablemax = nextarg : 0, \
    typetable[nextarg++] = type)

#define ADDSARG() \
    ((flags & MAXINT) ? ADDTYPE(T_MAXINT) : \

```

```

((flags&PTRINT) ? ADDTYPE(T_PTRINT) : \
((flags&SIZEINT) ? ADDTYPE(T_SSIZEINT) : \
((flags&LLONGINT) ? ADDTYPE(T_LLONG) : \
((flags&LONGINT) ? ADDTYPE(T_LONG) : \
((flags&SHORTINT) ? ADDTYPE(T_SHORT) : \
((flags&CHARINT) ? ADDTYPE(T_CHAR) : ADDTYPE(T_INT))))))

#define ADDUARG() \
    ((flags&MAXINT) ? ADDTYPE(T_MAXUINT) : \
    ((flags&PTRINT) ? ADDTYPE(T_PTRINT) : \
    ((flags&SIZEINT) ? ADDTYPE(T_SIZEINT) : \
    ((flags&LLONGINT) ? ADDTYPE(T_U_LLONG) : \
    ((flags&LONGINT) ? ADDTYPE(T_U_LONG) : \
    ((flags&SHORTINT) ? ADDTYPE(T_U_SHORT) : \
    ((flags&CHARINT) ? ADDTYPE(T_U_CHAR) : ADDTYPE(T_U_INT))))))

/*
 * Add * arguments to the type array.
 */
#define ADDASTER() \
n2 = 0; \
cp = fmt; \
while (is_digit(*cp)) { \
    APPEND_DIGIT(n2, *cp); \
    cp++; \
} \
if (*cp == '$') { \
    int hold = nextarg; \
    nextarg = n2; \
    ADDTYPE(T_INT); \
    nextarg = hold; \
    fmt = ++cp; \
} else { \
    ADDTYPE(T_INT); \
} \
fmt = (char *)fmt0;
typetable = stattypetable;
tablesize = STATIC_ARG_TBL_SIZE;
tablemax = 0;
nextarg = 1;
memset(typetable, T_UNUSED, STATIC_ARG_TBL_SIZE);

/*
 * Scan the format for conversions (^%' character).
 */
for (;) {
    for (cp = fmt; (ch = *fmt) != '\0' && ch != '%'; fmt++)
        /* void */;

```

```

fmt++; /* skip over '%' */

flags = 0;

rflag: ch = *fmt++;
reswitch: switch (ch) {
    case ' ':
    case '#':
    case '\':
        goto rflag;
    case '*':
        ADDASTER();
        goto rflag;
    case '-':
    case '+':
        goto rflag;
    case '!':
        if ((ch = *fmt++) == '*') {
            ADDASTER();
            goto rflag;
        }
        while (is_digit(ch)) {
            ch = *fmt++;
        }
        goto rflag;
    case '0':
        goto rflag;
    case '1': case '2': case '3': case '4':
    case '5': case '6': case '7': case '8': case '9':
        n = 0;
        do {
            APPEND_DIGIT(n ,ch);
            ch = *fmt++;
        } while (is_digit(ch));
        if (ch == '$') {
            nextarg = n;
            goto rflag;
        }
        goto rflag;
#ifdef FLOATING_POINT
    case 'L':
        flags |= LONGDBL;
        goto rflag;
#endif
    case 'h':
        if (*fmt == 'h') {
            fmt++;
            flags |= CHARINT;

```

```

    } else {
        flags |= SHORTINT;
    }
    goto rflag;
case 'j':
    flags |= MAXINT;
    goto rflag;
case 'l':
    if (*fmt == 'l') {
        fmt++;
        flags |= LLONGINT;
    } else {
        flags |= LONGINT;
    }
    goto rflag;
case 'q':
    flags |= LLONGINT;
    goto rflag;
case 't':
    flags |= PTRINT;
    goto rflag;
case 'z':
    flags |= SIZEINT;
    goto rflag;
case 'c':
#ifdef PRINTF_WIDE_CHAR
    if (flags & LONGINT)
        ADDTYPE(T_WINT);
    else
#endif
        ADDTYPE(T_INT);
    break;
case 'D':
    flags |= LONGINT;
    /*FALLTHROUGH*/
case 'd':
case 'i':
    ADDSARG();
    break;
#ifdef FLOATING_POINT
case 'a':
case 'A':
case 'e':
case 'E':
case 'f':
case 'F':
case 'g':
case 'G':

```

```

if (flags & LONGDBL)
    ADDTYPE(T_LONG_DOUBLE);
else
    ADDTYPE(T_DOUBLE);
break;
#endif /* FLOATING_POINT */
#ifndef NO_PRINTF_PERCENT_N
case 'n':
    if (flags & LLONGINT)
        ADDTYPE(TP_LLONG);
    else if (flags & LONGINT)
        ADDTYPE(TP_LONG);
    else if (flags & SHORTINT)
        ADDTYPE(TP_SHORT);
    else if (flags & PTRINT)
        ADDTYPE(TP_PTRINT);
    else if (flags & SIZEINT)
        ADDTYPE(TP_SSIZEINT);
    else if (flags & MAXINT)
        ADDTYPE(TP_MAXINT);
    else
        ADDTYPE(TP_INT);
    continue; /* no output */
#endif /* NO_PRINTF_PERCENT_N */
case 'O':
    flags |= LONGINT;
    /*FALLTHROUGH*/
case 'o':
    ADDUARG();
    break;
case 'p':
    ADDTYPE(TP_VOID);
    break;
case 's':
#ifdef PRINTF_WIDE_CHAR
    if (flags & LONGINT)
        ADDTYPE(TP_WCHAR);
    else
#endif
    ADDTYPE(TP_CHAR);
    break;
case 'U':
    flags |= LONGINT;
    /*FALLTHROUGH*/
case 'u':
case 'X':
case 'x':
    ADDUARG();

```



```

break;
default: /* "%?" prints ?, unless ? is NUL */
if (ch == '\0')
    goto done;
break;
}
}
done:
/*
 * Build the argument table.
 */
if (tablemax >= STATIC_ARG_TBL_SIZE) {
 *argtablesiz = sizeof(union arg) * (tablemax + 1);
 *argtable = mmap_alloc(*argtablesiz);
 if (*argtable == NULL)
    return -1;
}

for (n = 1; n <= tablemax; n++) {
 switch (typetable[n]) {
 case T_UNUSED:
 case T_CHAR:
 case T_U_CHAR:
 case T_SHORT:
 case T_U_SHORT:
 case T_INT:
 (*argtable)[n].intarg = va_arg(ap, int);
 break;
 case TP_SHORT:
 (*argtable)[n].pshortarg = va_arg(ap, short *);
 break;
 case T_U_INT:
 (*argtable)[n].uintarg = va_arg(ap, unsigned int);
 break;
 case TP_INT:
 (*argtable)[n].pintarg = va_arg(ap, int *);
 break;
 case T_LONG:
 (*argtable)[n].longarg = va_arg(ap, long);
 break;
 case T_U_LONG:
 (*argtable)[n].ulongarg = va_arg(ap, unsigned long);
 break;
 case TP_LONG:
 (*argtable)[n].plongarg = va_arg(ap, long *);
 break;
 case T_LLONG:
 (*argtable)[n].longlongarg = va_arg(ap, long long);

```

```

break;
case T_U_LLONG:
(*argtable)[n].ulonglongarg = va_arg(ap, unsigned long long);
break;
case TP_LLONG:
(*argtable)[n].plonglongarg = va_arg(ap, long long *);
break;
#ifdef FLOATING_POINT
case T_DOUBLE:
(*argtable)[n].doublearg = va_arg(ap, double);
break;
case T_LONG_DOUBLE:
(*argtable)[n].longdoublearg = va_arg(ap, long double);
break;
#endif
case TP_CHAR:
(*argtable)[n].pchararg = va_arg(ap, char *);
break;
case TP_VOID:
(*argtable)[n].pvoidarg = va_arg(ap, void *);
break;
case T_PTRINT:
(*argtable)[n].ptrdiffarg = va_arg(ap, ptrdiff_t);
break;
case TP_PTRINT:
(*argtable)[n].pptrdiffarg = va_arg(ap, ptrdiff_t *);
break;
case T_SIZEINT:
(*argtable)[n].sizearg = va_arg(ap, size_t);
break;
case T_SSIZEINT:
(*argtable)[n].ssizearg = va_arg(ap, ssize_t);
break;
case TP_SSIZEINT:
(*argtable)[n].pssizearg = va_arg(ap, ssize_t *);
break;
case T_MAXINT:
(*argtable)[n].intmaxarg = va_arg(ap, intmax_t);
break;
case T_MAXUINT:
(*argtable)[n].uintmaxarg = va_arg(ap, uintmax_t);
break;
case TP_MAXINT:
(*argtable)[n].pintmaxarg = va_arg(ap, intmax_t *);
break;
#ifdef PRINTF_WIDE_CHAR
case T_WINT:
(*argtable)[n].wintarg = va_arg(ap, wint_t);

```

```

    break;
case TP_WCHAR:
    (*argtable)[n].pwchararg = va_arg(ap, wchar_t *);
    break;
#endif
}
}
goto finish;

overflow:
errno = ENOMEM;
ret = -1;

finish:
if (typetable != NULL && typetable != sttypetable) {
    mmap_free(typetable, *argtablesiz);
    typetable = NULL;
}
return ret;
}

/*
 * Increase the size of the type table.
 */
static int
__grow_type_table(unsigned char **typetable, int *tablesize)
{
    unsigned char *oldtable = *typetable;
    int newsize = *tablesize * 2;

    if (newsize < sysconf(_SC_PAGESIZE))
        newsize = sysconf(_SC_PAGESIZE);

    if (*tablesize == STATIC_ARG_TBL_SIZE) {
        *typetable = mmap_alloc(newsize);
        if (*typetable == NULL)
            return -1;
        memcpy(*typetable, oldtable, *tablesize);
    } else {
        unsigned char *new = mmap_alloc(newsize);
        if (new == NULL)
            return -1;
        memmove(new, *typetable, *tablesize);
        mmap_free(*typetable, *tablesize);
        *typetable = new;
    }
    memset(*typetable + *tablesize, T_UNUSED, (newsize - *tablesize));
}

```

```

*tablesize = newsize;
return 0;
}

#ifdef FLOATING_POINT
static int
exponent(char *p0, int exp, int fmtch)
{
char *p, *t;
char expbuf[MAXEXPDIG];

p = p0;
*p++ = fmtch;
if (exp < 0) {
exp = -exp;
*p++ = '-';
} else
*p++ = '+';
t = expbuf + MAXEXPDIG;
if (exp > 9) {
do {
*--t = to_char(exp % 10);
} while ((exp /= 10) > 9);
*--t = to_char(exp);
for (; t < expbuf + MAXEXPDIG; *p++ = *t++)
/* nothing */;
} else {
/*
 * Exponents for decimal floating point conversions
 * (%[eEgG]) must be at least two characters long,
 * whereas exponents for hexadecimal conversions can
 * be only one character long.
 */
if (fmtch == 'e' || fmtch == 'E')
*p++ = '0';
*p++ = to_char(exp);
}
return p - p0;
}
#endif /* FLOATING_POINT */

#if !defined(HAVE_VSNPRINTF) || defined(PREFER_PORTABLE_SNPRINTF)
int
sudo_vsnprintf(char *str, size_t n, const char *fmt, va_list ap)
{

return xxxprintf(&str, n, 0, fmt, ap);
}

```

```

}
#endif /* !HAVE_VSNPRINTF || PREFER_PORTABLE_SNPRINTF */

#if !defined(HAVE_SNPRINTF) || defined(PREFER_PORTABLE_SNPRINTF)
int
sudo_snprintf(char *str, size_t n, char const *fmt, ...)
{
    int ret;
    va_list ap;

    va_start(ap, fmt);
    ret = xxxprintf(&str, n, 0, fmt, ap);
    va_end(ap);
    return ret;
}
#endif /* !HAVE_SNPRINTF || PREFER_PORTABLE_SNPRINTF */

#if !defined(HAVE_VASPRINTF) || defined(PREFER_PORTABLE_SNPRINTF)
int
sudo_vasprintf(char **str, const char *fmt, va_list ap)
{
    int ret;

    ret = xxxprintf(str, 0, 1, fmt, ap);
    if (ret == -1)
        *str = NULL;
    return ret;
}
#endif /* !HAVE_VASPRINTF || PREFER_PORTABLE_SNPRINTF */

#if !defined(HAVE_ASPRINTF) || defined(PREFER_PORTABLE_SNPRINTF)
int
sudo_asprintf(char **str, char const *fmt, ...)
{
    int ret;
    va_list ap;

    va_start(ap, fmt);
    ret = xxxprintf(str, 0, 1, fmt, ap);
    va_end(ap);
    if (ret == -1)
        *str = NULL;
    return ret;
}
#endif /* !HAVE_ASPRINTF || PREFER_PORTABLE_SNPRINTF */

#endif /* !HAVE_VSNPRINTF || !HAVE_SNPRINTF || !HAVE_VASPRINTF || !HAVE_ASPRINTF ||
PREFER_PORTABLE_SNPRINTF */

```

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```
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```

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```

```
*/
```

```
#include <config.h>
```

```
#if !defined(HAVE_INET_PTON)
```

```
#include <sys/types.h>
```

```
#include <sys/socket.h>
```

```
#include <netinet/in.h>
```

```
#include <arpa/inet.h>
```

```
#include <arpa/nameser.h>
```

```
#ifdef HAVE_STRING_H
```

```
# include <string.h>
```

```
#endif /* HAVE_STRING_H */
```

```
#ifdef HAVE_STRINGS_H
```

```
# include <strings.h>
```

```

#endif /* HAVE_STRINGS_H */
#include <errno.h>

#include "sudo_compat.h"

#ifndef EAFNOSUPPORT
# define EAFNOSUPPORT EINVAL
#endif

#ifndef NS_INADDRSZ
# ifdef INADDRSZ
# define NS_INADDRSZ INADDRSZ
# else
# define NS_INADDRSZ 4
# endif
#endif

#ifndef NS_IN6ADDRSZ
# ifdef IN6ADDRSZ
# define NS_IN6ADDRSZ IN6ADDRSZ
# else
# define NS_IN6ADDRSZ 16
# endif
#endif

#ifndef NS_INT16SZ
# ifdef INT16SZ
# define NS_INT16SZ INT16SZ
# else
# define NS_INT16SZ 2
# endif
#endif

/*
 * WARNING: Don't even consider trying to compile this on a system where
 * sizeof(int) < 4. sizeof(int) > 4 is fine; all the world's not a VAX.
 */

/* int
 * inet_pton4(src, dst)
 * like inet_aton() but without all the hexadecimal and shorthand.
 * return:
 * 1 if `src' is a valid dotted quad, else 0.
 * notice:
 * does not touch `dst' unless it's returning 1.
 * author:
 * Paul Vixie, 1996.
 */
static int
inet_pton4(const char *src, u_char *dst)

```

```

{
const char digits[] = "0123456789";
int saw_digit, octets, ch;
u_char tmp[NS_INADDRSZ], *tp;

saw_digit = 0;
octets = 0;
/* cppcheck-suppress uninitvar */
*(tp = tmp) = '\0';
while ((ch = (unsigned char)*src++) != '\0') {
const char *pch;

if ((pch = strchr(digits, ch)) != NULL) {
u_int new = *tp * 10 + (pch - digits);

if (new > 255)
return (0);
if (!saw_digit) {
if (++octets > 4)
return (0);
saw_digit = 1;
}
*tp = new;
} else if (ch == '.' && saw_digit) {
if (octets == 4)
return (0);
*++tp = 0;
saw_digit = 0;
} else
return (0);
}
if (octets < 4)
return (0);

memcpy(dst, tmp, NS_INADDRSZ);
return (1);
}

#ifdef HAVE_STRUCT_IN6_ADDR
/* int
* inet_pton6(src, dst)
* convert presentation level address to network order binary form.
* return:
* 1 if `src' is a valid [RFC1884 2.2] address, else 0.
* notice:
* does not touch `dst' unless it's returning 1.
* credit:
* inspired by Mark Andrews.

```

```

* author:
* Paul Vixie, 1996.
*/
static int
inet_pton6(const char *src, u_char *dst)
{
    const char xdigits_l[] = "0123456789abcdef",
              xdigits_u[] = "0123456789ABCDEF";
    u_char tmp[NS_IN6ADDRSZ], *tp, *endp, *colonp;
    const char *xdigits, *curtok;
    int ch, saw_xdigit, count_xdigit;
    u_int val;

    /* cppcheck-suppress uninitvar */
    memset((tp = tmp), 0, NS_IN6ADDRSZ);
    endp = tp + NS_IN6ADDRSZ;
    colonp = NULL;
    /* Leading :: requires some special handling. */
    if (*src == ':')
        if (*++src != ':')
            return (0);
    curtok = src;
    saw_xdigit = count_xdigit = 0;
    val = 0;
    while ((ch = (unsigned char)*src++) != '\0') {
        const char *pch;

        if ((pch = strchr((xdigits = xdigits_l), ch)) == NULL)
            pch = strchr((xdigits = xdigits_u), ch);
        if (pch != NULL) {
            if (count_xdigit >= 4)
                return (0);
            val <<= 4;
            val |= (pch - xdigits);
            if (val > 0xffff)
                return (0);
            saw_xdigit = 1;
            count_xdigit++;
            continue;
        }
        if (ch == ':') {
            curtok = src;
            if (!saw_xdigit) {
                if (colonp)
                    return (0);
                colonp = tp;
                continue;
            } else if (*src == '\0') {

```

```

    return (0);
}
if (tp + NS_INT16SZ > endp)
    return (0);
*tp++ = (u_char) (val >> 8) & 0xff;
*tp++ = (u_char) val & 0xff;
saw_xdigit = 0;
count_xdigit = 0;
val = 0;
continue;
}
if (ch == '.' && ((tp + NS_INADDRSZ) <= endp) &&
    inet_pton4(curtok, tp) > 0) {
    tp += NS_INADDRSZ;
    saw_xdigit = 0;
    count_xdigit = 0;
    break; /* '\0' was seen by inet_pton4(). */
}
return (0);
}
if (saw_xdigit) {
    if (tp + NS_INT16SZ > endp)
        return (0);
    *tp++ = (u_char) (val >> 8) & 0xff;
    *tp++ = (u_char) val & 0xff;
}
if (colonp != NULL) {
    /*
     * Since some memmove()'s erroneously fail to handle
     * overlapping regions, we'll do the shift by hand.
     */
    const long n = tp - colonp;
    long i;

    if (tp == endp)
        return (0);
    for (i = 1; i <= n; i++) {
        endp[-i] = colonp[n - i];
        colonp[n - i] = 0;
    }
    tp = endp;
}
if (tp != endp)
    return (0);
memcpy(dst, tmp, NS_IN6ADDRSZ);
return (1);
}
#endif /* HAVE_STRUCT_IN6_ADDR */

```

```

/* int
 * inet_pton(af, src, dst)
 * convert from presentation format (which usually means ASCII printable)
 * to network format (which is usually some kind of binary format).
 * return:
 * 1 if the address was valid for the specified address family
 * 0 if the address wasn't valid (`dst' is untouched in this case)
 * -1 if some other error occurred (`dst' is untouched in this case, too)
 * author:
 * Paul Vixie, 1996.
 */
int
sudo_inet_pton(int af, const char *src, void *dst)
{
    switch (af) {
    case AF_INET:
        return (inet_pton4(src, dst));
#ifdef HAVE_STRUCT_INET6_ADDR
    case AF_INET6:
        return (inet_pton6(src, dst));
#endif /* HAVE_STRUCT_INET6_ADDR */
    default:
        errno = EAFNOSUPPORT;
        return (-1);
    }
    /* NOTREACHED */
}

#endif /* HAVE_INET_PTON */
/*
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 */
/*

```

```

* Adapted from the following code written by Emin Martinian:
* http://web.mit.edu/~emin/www/source\_code/red\_black\_tree/index.html
*
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*/

```

```
#include <config.h>
```

```
#include <sys/types.h>
```

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include "sdoers.h"
```

```
#include "redblack.h"
```

```

static void rbrepair(struct rbtree *, struct rbnode *);
static void rotate_left(struct rbtree *, struct rbnode *);
static void rotate_right(struct rbtree *, struct rbnode *);
static void rbdestroy_int(struct rbtree *, struct rbnode *, void (*)(void *));

```

```
/*
```

```
* Red-Black tree, see http://en.wikipedia.org/wiki/Red-black\_tree
```

```
*
```

```

* A red-black tree is a binary search tree where each node has a color
* attribute, the value of which is either red or black. Essentially, it
* is just a convenient way to express a 2-3-4 binary search tree where
* the color indicates whether the node is part of a 3-node or a 4-node.
* In addition to the ordinary requirements imposed on binary search
* trees, we make the following additional requirements of any valid

```



```

* red-black tree:
* 1) Every node is either red or black.
* 2) The root is black.
* 3) All leaves are black.
* 4) Both children of each red node are black.
* 5) The paths from each leaf up to the root each contain the same
*    number of black nodes.
*/

/*
* Create a red black tree struct using the specified compare routine.
* Allocates and returns the initialized (empty) tree or NULL if
* memory cannot be allocated.
*/
struct rbtree *
rbcreate(int (*compar)(const void *, const void*))
{
    struct rbtree *tree;
    debug_decl(rbcreate, SUDOERS_DEBUG_RBTREE)

    if ((tree = malloc(sizeof(*tree))) == NULL) {
        sudo_debug_printf(SUDO_DEBUG_ERROR|SUDO_DEBUG_LINENO,
            "unable to allocate memory");
        debug_return_ptr(NULL);
    }

    tree->compar = compar;

    /*
     * We use a self-referencing sentinel node called nil to simplify the
     * code by avoiding the need to check for NULL pointers.
     */
    tree->nil.left = tree->nil.right = tree->nil.parent = &tree->nil;
    tree->nil.color = black;
    tree->nil.data = NULL;

    /*
     * Similarly, the fake root node keeps us from having to worry
     * about splitting the root.
     */
    tree->root.left = tree->root.right = tree->root.parent = &tree->nil;
    tree->root.color = black;
    tree->root.data = NULL;

    debug_return_ptr(tree);
}

/*

```

```

* Perform a left rotation starting at node.
*/
static void
rotate_left(struct rbtree *tree, struct rbnode *node)
{
    struct rbnode *child;
    debug_decl(rotate_left, SUDOERS_DEBUG_RBTREE)

    child = node->right;
    node->right = child->left;

    if (child->left != rbnil(tree))
        child->left->parent = node;
    child->parent = node->parent;

    if (node == node->parent->left)
node->parent->left = child;
    else
node->parent->right = child;
    child->left = node;
    node->parent = child;

    debug_return;
}

/*
* Perform a right rotation starting at node.
*/
static void
rotate_right(struct rbtree *tree, struct rbnode *node)
{
    struct rbnode *child;
    debug_decl(rotate_right, SUDOERS_DEBUG_RBTREE)

    child = node->left;
    node->left = child->right;

    if (child->right != rbnil(tree))
        child->right->parent = node;
    child->parent = node->parent;

    if (node == node->parent->left)
node->parent->left = child;
    else
node->parent->right = child;
    child->right = node;
    node->parent = child;
}

```

```

    debug_return;
}

/*
 * Insert data pointer into a redblack tree.
 * Returns a 0 on success, 1 if a node matching "data" already exists
 * (filling in "existing" if not NULL), or -1 on malloc() failure.
 */
int
rbinsert(struct rbtree *tree, void *data, struct rbnode **existing)
{
    struct rbnode *node = rbfirst(tree);
    struct rbnode *parent = rbroot(tree);
    int res;
    debug_decl(rbinsert, SUDOERS_DEBUG_RBTREE)

    /* Find correct insertion point. */
    while (node != rbnil(tree)) {
        parent = node;
        if ((res = tree->compar(data, node->data)) == 0) {
            if (existing != NULL)
                *existing = node;
            debug_return_int(1);
        }
        node = res < 0 ? node->left : node->right;
    }

    node = malloc(sizeof(*node));
    if (node == NULL) {
        sudo_debug_printf(SUDO_DEBUG_ERROR|SUDO_DEBUG_LINENO,
            "unable to allocate memory");
        debug_return_int(-1);
    }
    node->data = data;
    node->left = node->right = rbnil(tree);
    node->parent = parent;
    if (parent == rbroot(tree) || tree->compar(data, parent->data) < 0)
        parent->left = node;
    else
        parent->right = node;
    node->color = red;

    /*
     * If the parent node is black we are all set, if it is red we have
     * the following possible cases to deal with. We iterate through
     * the rest of the tree to make sure none of the required properties
     * is violated.
     */
}

```

```

* 1) The uncle is red. We repaint both the parent and uncle black
*   and repaint the grandparent node red.
*
* 2) The uncle is black and the new node is the right child of its
*   parent, and the parent in turn is the left child of its parent.
*   We do a left rotation to switch the roles of the parent and
*   child, relying on further iterations to fixup the old parent.
*
* 3) The uncle is black and the new node is the left child of its
*   parent, and the parent in turn is the left child of its parent.
*   We switch the colors of the parent and grandparent and perform
*   a right rotation around the grandparent. This makes the former
*   parent the parent of the new node and the former grandparent.
*
* Note that because we use a sentinel for the root node we never
* need to worry about replacing the root.
*/
while (node->parent->color == red) {
struct rbnode *uncle;
if (node->parent == node->parent->parent->left) {
    uncle = node->parent->parent->right;
    if (uncle->color == red) {
node->parent->color = black;
uncle->color = black;
node->parent->parent->color = red;
node = node->parent->parent;
    } else /* if (uncle->color == black) */ {
if (node == node->parent->right) {
    node = node->parent;
    rotate_left(tree, node);
}
node->parent->color = black;
node->parent->parent->color = red;
rotate_right(tree, node->parent->parent);
}
} else /* if (node->parent == node->parent->parent->right) */
    uncle = node->parent->parent->left;
    if (uncle->color == red) {
node->parent->color = black;
uncle->color = black;
node->parent->parent->color = red;
node = node->parent->parent;
    } else /* if (uncle->color == black) */ {
if (node == node->parent->left) {
    node = node->parent;
    rotate_right(tree, node);
}
node->parent->color = black;

```

```

node->parent->parent->color = red;
rotate_left(tree, node->parent->parent);
    }
}
}
rbfirst(tree)->color = black; /* first node is always black */
debug_return_int(0);
}

/*
 * Look for a node matching key in tree.
 * Returns a pointer to the node if found, else NULL.
 */
struct rbnode *
rbfind(struct rbtree *tree, void *key)
{
    struct rbnode *node = rbfirst(tree);
    int res;
    debug_decl(rbfind, SUDOERS_DEBUG_RBTREE)

    while (node != rbnil(tree)) {
if ((res = tree->compar(key, node->data)) == 0)
        debug_return_ptr(node);
node = res < 0 ? node->left : node->right;
    }
    debug_return_ptr(NULL);
}

/*
 * Call func() for each node, passing it the node data and a cookie;
 * If func() returns non-zero for a node, the traversal stops and the
 * error value is returned. Returns 0 on successful traversal.
 */
int
rbapply_node(struct rbtree *tree, struct rbnode *node,
             int (*func)(void *, void *), void *cookie, enum rbtraversal order)
{
    int error;
    debug_decl(rbapply_node, SUDOERS_DEBUG_RBTREE)

    if (node != rbnil(tree)) {
if (order == preorder)
        if ((error = func(node->data, cookie)) != 0)
            debug_return_int(error);
if ((error = rbapply_node(tree, node->left, func, cookie, order)) != 0)
            debug_return_int(error);
if (order == inorder)
        if ((error = func(node->data, cookie)) != 0)

```

```

debug_return_int(error);
if ((error = rbapply_node(tree, node->right, func, cookie, order)) != 0)
    debug_return_int(error);
if (order == postorder)
    if ((error = func(node->data, cookie)) != 0)
        debug_return_int(error);
    }
    debug_return_int(0);
}

/*
 * Returns the successor of node, or nil if there is none.
 */
static struct rbnode *
rbsuccessor(struct rbtree *tree, struct rbnode *node)
{
    struct rbnode *succ;
    debug_decl(rbsuccessor, SUDOERS_DEBUG_RBTREE)

    if ((succ = node->right) != rbnil(tree)) {
        while (succ->left != rbnil(tree))
            succ = succ->left;
        } else {
        /* No right child, move up until we find it or hit the root */
        for (succ = node->parent; node == succ->right; succ = succ->parent)
            node = succ;
        if (succ == rbroot(tree))
            succ = rbnil(tree);
        }
        debug_return_ptr(succ);
    }

/*
 * Recursive portion of rbdestroy().
 */
static void
rbdestroy_int(struct rbtree *tree, struct rbnode *node, void (*destroy)(void *))
{
    debug_decl(rbdestroy_int, SUDOERS_DEBUG_RBTREE)
    if (node != rbnil(tree)) {
        rbdestroy_int(tree, node->left, destroy);
        rbdestroy_int(tree, node->right, destroy);
        if (destroy != NULL)
            destroy(node->data);
        free(node);
    }
    debug_return;
}

```

```

/*
 * Destroy the specified tree, calling the destructor "destroy"
 * for each node and then freeing the tree itself.
 */
void
rbdestroy(struct rbtree *tree, void (*destroy)(void *))
{
    debug_decl(rbdestroy, SUDOERS_DEBUG_RBTREE)
    rbdestroy_int(tree, rbfirst(tree), destroy);
    free(tree);
    debug_return;
}

/*
 * Delete node 'z' from the tree and return its data pointer.
 */
void *rbdelete(struct rbtree *tree, struct rbnode *z)
{
    struct rbnode *x, *y;
    void *data = z->data;
    debug_decl(rbdelete, SUDOERS_DEBUG_RBTREE)

    if (z->left == rbnil(tree) || z->right == rbnil(tree))
        y = z;
    else
        y = rbsuccessor(tree, z);
    x = (y->left == rbnil(tree)) ? y->right : y->left;

    if ((x->parent = y->parent) == rbroot(tree)) {
        rbfirst(tree) = x;
    } else {
        if (y == y->parent->left)
            y->parent->left = x;
        else
            y->parent->right = x;
    }
    if (y->color == black)
        rbrepair(tree, x);
    if (y != z) {
        y->left = z->left;
        y->right = z->right;
        y->parent = z->parent;
        y->color = z->color;
        z->left->parent = z->right->parent = y;
        if (z == z->parent->left)
            z->parent->left = y;
        else

```

```

    z->parent->right = y;
}
free(z);

debug_return_ptr(data);
}

/*
 * Repair the tree after a node has been deleted by rotating and repainting
 * colors to restore the 4 properties inherent in red-black trees.
 */
static void
rbrepair(struct rbtree *tree, struct rbnode *node)
{
    struct rbnode *sibling;
    debug_decl(rbrepair, SUDOERS_DEBUG_RBTREE)

    while (node->color == black && node != rbfirst(tree)) {
if (node == node->parent->left) {
    sibling = node->parent->right;
    if (sibling->color == red) {
sibling->color = black;
node->parent->color = red;
rotate_left(tree, node->parent);
sibling = node->parent->right;
    }
    if (sibling->right->color == black && sibling->left->color == black) {
sibling->color = red;
node = node->parent;
    } else {
if (sibling->right->color == black) {
    sibling->left->color = black;
    sibling->color = red;
    rotate_right(tree, sibling);
    sibling = node->parent->right;
    }
sibling->color = node->parent->color;
node->parent->color = black;
sibling->right->color = black;
rotate_left(tree, node->parent);
node = rbfirst(tree); /* exit loop */
    }
} else { /* if (node == node->parent->right) */
    sibling = node->parent->left;
    if (sibling->color == red) {
sibling->color = black;
node->parent->color = red;
rotate_right(tree, node->parent);

```



```

sibling = node->parent->left;
    }
    if (sibling->right->color == black && sibling->left->color == black) {
sibling->color = red;
node = node->parent;
    } else {
if (sibling->left->color == black) {
    sibling->right->color = black;
    sibling->color = red;
    rotate_left(tree, sibling);
    sibling = node->parent->left;
    }
sibling->color = node->parent->color;
node->parent->color = black;
sibling->left->color = black;
rotate_right(tree, node->parent);
node = rbfirst(tree); /* exit loop */
    }
}
}
node->color = black;

debug_return;
}

```

## 1.34 tinyxml 2.6.2

### 1.34.1 Available under license :

```

/*
www.sourceforge.net/projects/tinyxml
Original code (2.0 and earlier )copyright (c) 2000-2006 Lee Thomason (www.grinninglizard.com)

```

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## 1.35 u-boot 2013\_Q3\_eng\_drop\_2

### 1.35.1 Available under license :

From d223f6b3f1be839e23c5b21aa4a266f84a75acec Mon Sep 17 00:00:00 2001  
From: Neta Zur <neta@marvell.com>  
Date: Thu, 15 Aug 2013 09:07:29 +0300  
Subject: [PATCH 0631/2009] fix: common: update copyright header

use include to mvCopyright.h file instead of an old copyright header

Change-Id: I0e25072e7e163c750bbfec50958a194c78e6c68  
Signed-off-by: Neta Zur <neta@marvell.com>  
Reviewed-on: <http://vgitil04.il.marvell.com:8080/3035>  
Tested-by: Star\_Automation <star@marvell.com>  
Reviewed-by: Nadav Haklai <nadavh@marvell.com>

---

board/mv\_ebu/common/common/mvList.c | 17 +++-----  
board/mv\_ebu/common/common/mvList.h | 17 +++-----  
board/mv\_ebu/common/common/mvStack.c | 17 +++-----  
board/mv\_ebu/common/common/mvStack.h | 17 +++-----  
4 files changed, 12 insertions(+), 56 deletions(-)

diff --git a/board/mv\_ebu/common/common/mvList.c b/board/mv\_ebu/common/common/mvList.c  
index 5d7928f..541b190 100644

--- a/board/mv\_ebu/common/common/mvList.c  
+++ b/board/mv\_ebu/common/common/mvList.c  
@@ -1,17 +1,6 @@

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\*\*\*\*\*

+#include "mvCopyright.h"

```

+
+/******
* mvList.c - Implementation File for Linked List.
*
* DESCRIPTION:
diff --git a/board/mv_ebu/common/common/mvList.h b/board/mv_ebu/common/common/mvList.h
index 9050b9e..ad26655 100644
--- a/board/mv_ebu/common/common/mvList.h
+++ b/board/mv_ebu/common/common/mvList.h
@@ -1,17 +1,6 @@
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_* (MJKK), MARVELL SEMICONDUCTOR ISRAEL LTD (MSIL).          *
_******
+
+#include "mvCopyright.h"
+
+
+/******
* mvList.h - Header File for Linked List.
*
* DESCRIPTION:
diff --git a/board/mv_ebu/common/common/mvStack.c b/board/mv_ebu/common/common/mvStack.c
index 696cb06..a2a0b0b 100644
--- a/board/mv_ebu/common/common/mvStack.c
+++ b/board/mv_ebu/common/common/mvStack.c
@@ -1,17 +1,6 @@
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_* (MJKK), MARVELL SEMICONDUCTOR ISRAEL LTD (MSIL).          *
_******

```

```

_*****
+#include "mvCopyright.h"
+
+/******
* mvQueue.c
*
* FILENAME: $Workfile: mvStack.c $
diff --git a/board/mv_ebu/common/common/mvStack.h b/board/mv_ebu/common/common/mvStack.h
index e7ff74b..353d52a 100644
--- a/board/mv_ebu/common/common/mvStack.h
+++ b/board/mv_ebu/common/common/mvStack.h
@@ -1,17 +1,6 @@
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-* (MJKK), MARVELL SEMICONDUCTOR ISRAEL LTD (MSIL).          *
_*****
+#include "mvCopyright.h"
+
+/******
* mvStack.h - Header File for :
*
* FILENAME: $Workfile: mvStack.h $
--
1.7.9.5
From 0adbe3af131850060daafb19644ddb1742beb9af Mon Sep 17 00:00:00 2001
From: Neta Zur <neta@marvell.com>
Date: Thu, 15 Aug 2013 10:28:42 +0300
Subject: [PATCH 0636/2009] fix: cpu: update copyright header

    use include to mvCopyright.h file instead of GPL header

Change-Id: Idc0e1117289627feb86e93f9911d9599d87b8116
Signed-off-by: Neta Zur <neta@marvell.com>
Reviewed-on: http://vgitil04.il.marvell.com:8080/3036
Tested-by: Star_Automation <star@marvell.com>
Reviewed-by: Nadav Haklai <nadavh@marvell.com>
---
.../common/mv_hal/cpu/feroceon/mvFeroceonCntrs.c | 16 +-----

```

```
board/mv_ebu/common/mv_hal/cpu/mvCpuCntrs.c | 16 +-----  
board/mv_ebu/common/mv_hal/cpu/mvCpuL2Cntrs.c | 16 +-----  
board/mv_ebu/common/mv_hal/cpu/pj4/mvPJ4Cntrs.c | 16 +-----  
4 files changed, 4 insertions(+), 60 deletions(-)
```

```
diff --git a/board/mv_ebu/common/mv_hal/cpu/feroceon/mvFeroceonCntrs.c  
b/board/mv_ebu/common/mv_hal/cpu/feroceon/mvFeroceonCntrs.c  
index 5b9a091..db2268f 100644
```

```
--- a/board/mv_ebu/common/mv_hal/cpu/feroceon/mvFeroceonCntrs.c  
+++ b/board/mv_ebu/common/mv_hal/cpu/feroceon/mvFeroceonCntrs.c  
@@ -1,18 +1,4 @@
```

```
_/*
```

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```

```
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```

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```

```
_*/  
+#include "mvCopyright.h"
```

```
#include "mvOs.h"
```

```
#include "../mvCpuCntrs.h"
```

```
diff --git a/board/mv_ebu/common/mv_hal/cpu/mvCpuCntrs.c b/board/mv_ebu/common/mv_hal/cpu/mvCpuCntrs.c  
index 33f8c06..f78bc0b 100644
```

```
--- a/board/mv_ebu/common/mv_hal/cpu/mvCpuCntrs.c  
+++ b/board/mv_ebu/common/mv_hal/cpu/mvCpuCntrs.c  
@@ -1,18 +1,4 @@
```

```
_/*
```

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```

```
_*
```

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```

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- \*/

+#include "mvCopyright.h"

#include "mvOs.h"

#include "mvCpuCnters.h"

diff --git a/board/mv\_ebu/common/mv\_hal/cpu/mvCpuL2Cnters.c

b/board/mv\_ebu/common/mv\_hal/cpu/mvCpuL2Cnters.c

index 18120be..19460af 100644

--- a/board/mv\_ebu/common/mv\_hal/cpu/mvCpuL2Cnters.c

+++ b/board/mv\_ebu/common/mv\_hal/cpu/mvCpuL2Cnters.c

@@ -1,18 +1,4 @@

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- \*/

+#include "mvCopyright.h"

#include "mvOs.h"

#include "mvCpuL2Cnters.h"

diff --git a/board/mv\_ebu/common/mv\_hal/cpu/pj4/mvPJ4Cnters.c

b/board/mv\_ebu/common/mv\_hal/cpu/pj4/mvPJ4Cnters.c

index 0b38381..836f267 100644

--- a/board/mv\_ebu/common/mv\_hal/cpu/pj4/mvPJ4Cnters.c

+++ b/board/mv\_ebu/common/mv\_hal/cpu/pj4/mvPJ4Cnters.c

@@ -1,18 +1,4 @@

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- \*/

+#include "mvCopyright.h"

#include "mvOs.h"

#include "../mvCpuCnters.h"

--

1.7.9.5

From 61c56e2b35786fa69e425f3e73d4cbd8e54e8e18 Mon Sep 17 00:00:00 2001

From: Neta Zur <neta@marvell.com>

Date: Tue, 9 Jul 2013 16:16:38 +0300

Subject: [PATCH 0531/2009] Marvell copyright header

This copyright file is replacing the current Marvell Triple license header. each file with Marvell triple copyright, should add include to this h file in the beginning of the file. This is relevant to files that are common to more than one OSs. This license header include Marvell Quad header, include the current license headers - GPL, BSD & Marvell Commercial License, and addition of a new license header - General Public License FreeRTOS Exception.

Change-Id: Ie8b6f03bfab41273575b451e7c741507b8cca17d

Signed-off-by: Neta Zur <neta@marvell.com>

Reviewed-on: <http://vgitil04.il.marvell.com:8080/2463>

Reviewed-by: Maen Suleiman <maen@marvell.com>

Reviewed-by: Nadav Haklai <nadavh@marvell.com>

Tested-by: Nadav Haklai <nadavh@marvell.com>

---

board/mv\_ebu/common/common/mvCopyright.h | 97 ++++++

1 file changed, 97 insertions(+)

create mode 100644 board/mv\_ebu/common/common/mvCopyright.h

diff --git a/board/mv\_ebu/common/common/mvCopyright.h b/board/mv\_ebu/common/common/mvCopyright.h

new file mode 100644

index 0000000..458562b

--- /dev/null

+++ b/board/mv\_ebu/common/common/mvCopyright.h

@@ -0,0 +1,97 @@

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1.7.9.5

From 3119d3409bd752808772589578e525a1294935dc Mon Sep 17 00:00:00 2001

From: Neta Zur <neta@marvell.com>

Date: Tue, 1 Oct 2013 11:01:52 +0200

Subject: [PATCH 0671/2009] fix: qd-dsdt: update copyright header

use qd-dsdt copyright header file instead of proprietary header

Change-Id: Id745d6cb389de29a86b5762e9d15316bf7d08dcc

Signed-off-by: Neta Zur <neta@marvell.com>

Reviewed-on: http://vgitil04.il.marvell.com:8080/3619

Tested-by: Star\_Automation <star@marvell.com>

Reviewed-by: Nadav Haklai <nadavh@marvell.com>

---

```
../mv_hal/qd-dsdt-3.3/Include/h/msApi/gtVct.h | 15 +++-----
../common/mv_hal/qd-dsdt-3.3/Include/msApiTypes.h | 11 +-----
../common/mv_hal/qd-dsdt/Include/h/msApi/gtVct.h | 15 +++-----
../common/mv_hal/qd-dsdt/Include/msApiTypes.h | 11 +-----
4 files changed, 6 insertions(+), 46 deletions(-)
```

```
diff --git a/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/h/msApi/gtVct.h
b/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/h/msApi/gtVct.h
index 4fd3f94..ca5b8e7 100644
```

```
--- a/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/h/msApi/gtVct.h
+++ b/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/h/msApi/gtVct.h
@@ -1,17 +1,6 @@
+#include <Copyright.h>
```

+

```
/*****
```

```
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```
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```

```
_****
```

```
* gtPhy.h
```

```
*
```

```
* DESCRIPTION:
```

```
diff --git a/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/msApiTypes.h
b/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/msApiTypes.h
index a2ef122..ee1b364 100644
```

```
--- a/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/msApiTypes.h
+++ b/board/mv_ebu/common/mv_hal/qd-dsdt-3.3/Include/msApiTypes.h
@@ -1,13 +1,4 @@
```

```
_/*
```



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- */
```

```
+#include <Copyright.h>
```

```
/*
```

```
* FILENAME: $Workfile: mv_types.h $
```

```
--
```

```
1.7.9.5
```

```
From d94585ce826b7e523b124e24ab8887517f159640 Mon Sep 17 00:00:00 2001
```

```
From: Neta Zur <neta@marvell.com>
```

```
Date: Thu, 15 Aug 2013 10:31:30 +0300
```

```
Subject: [PATCH 0638/2009] fix: neta: update copyright header
```

use Marvell triple license header instead of GPL header

```
Change-Id: Ibf7ffa3abf58354f7c9cdc705258ff04af69c930
```

```
Signed-off-by: Neta Zur <neta@marvell.com>
```

```
Reviewed-on: http://vgitil04.il.marvell.com:8080/3037
```

```
Reviewed-by: Dmitri Epshtein <dima@marvell.com>
```

```
Reviewed-by: Nadav Haklai <nadavh@marvell.com>
```

```
Tested-by: Nadav Haklai <nadavh@marvell.com>
```

```
---
```

```
board/mv_ebu/common/mv_hal/neta/pnc/mvPncAging.c | 36 ++++++
```

```
1 file changed, 36 insertions(+)
```

```
diff --git a/board/mv_ebu/common/mv_hal/neta/pnc/mvPncAging.c
```

```
b/board/mv_ebu/common/mv_hal/neta/pnc/mvPncAging.c
```

```
index 232bb6f..8260963 100644
```

```
--- a/board/mv_ebu/common/mv_hal/neta/pnc/mvPncAging.c
```

```
+++ b/board/mv_ebu/common/mv_hal/neta/pnc/mvPncAging.c
```

```
@@ -9,6 +9,12 @@ introductory statement regarding license alternatives, (ii) delete the two
```

```
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```

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+

+\*\*\*\*\*/

#include "mvOs.h"

--

1.7.9.5

From b607bda07a2440b3778130b0c6bb5a9ba91b04c0 Mon Sep 17 00:00:00 2001

From: Neta Zur <neta@marvell.com>

Date: Mon, 1 Jul 2013 15:01:52 +0300

Subject: [PATCH 0497/2009] Add Marvell copyright to VANIR driver

Add Marvell copyright and Marvell GPL license to the VANIR driver files.

This is Marvell driver that was originated from Freescale driver.

Change-Id: I1dc2893307d608591bfa9e64b18ed9e84969ef59  
Signed-off-by: Neta Zur <neta@marvell.com>  
Reviewed-on: <http://vgitil04.il.marvell.com:8080/2376>  
Reviewed-by: Star\_Automation <star@marvell.com>  
Tested-by: Omri Itach <omrii@marvell.com>  
Reviewed-by: Omri Itach <omrii@marvell.com>

---  
drivers/block/mv94xx\_scsi.c | 18 ++++++  
include/mv94xx\_scsi.h | 18 ++++++  
2 files changed, 36 insertions(+)

diff --git a/drivers/block/mv94xx\_scsi.c b/drivers/block/mv94xx\_scsi.c  
index 8090c04..f3f0d89 100644

--- a/drivers/block/mv94xx\_scsi.c  
+++ b/drivers/block/mv94xx\_scsi.c  
@@ -1,3 +1,21 @@

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\* Author: Jason Jin<Jason.jin@freescale.com>

diff --git a/include/mv94xx\_scsi.h b/include/mv94xx\_scsi.h  
index 16fcb34..6f1c058 100644

--- a/include/mv94xx\_scsi.h  
+++ b/include/mv94xx\_scsi.h  
@@ -1,3 +1,21 @@

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\* Author: Jason Jin<[Jason.jin@freescale.com](mailto:Jason.jin@freescale.com)>

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1.7.9.5

## 1.36 ubi-utils 1.5.1

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### 1

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```
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```

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## 1.38 ubus 2015-05-25

**:f361bfa5fcb2daadf3b160583ce665024f8d108e**

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## 1.39 uci 2015-08-27.1

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## 1.40 zlib 1.2.8

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/\* zlib.h -- interface of the 'zlib' general purpose compression library  
version 1.2.8, April 28th, 2013

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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 (deflate format) and rfc1952 (gzip format).

\*/

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