

Dernière mise-à-jour : 2020/01/30 03:28

# LSF107 - Gestion des Paquets

## Compiler à partir des sources

Historiquement il était nécessaire d'installer un logiciel à partir de ses fichiers sources.

Pour comprendre ce qui est la compilation d'un logiciel, commencez par télécharger le logiciel hello :

```
SLES12SP1:~ # wget https://ftp.gnu.org/gnu/hello/hello-2.1.1.tar.gz
--2018-07-16 11:10:26-- https://ftp.gnu.org/gnu/hello/hello-2.1.1.tar.gz
Résolution de ftp.gnu.org (ftp.gnu.org)... 208.118.235.20
Connexion à ftp.gnu.org (ftp.gnu.org)|208.118.235.20|:443... connecté.
requête HTTP transmise, en attente de la réponse... 200 OK
Taille : 389363 (380K) [application/x-gzip]
Enregistre : «hello-2.1.1.tar.gz»

hello-2.1.1.tar.gz          100%[=====>] 380,24K
946KB/s   ds 0,4s

2018-07-16 11:10:27 (946 KB/s) - «hello-2.1.1.tar.gz» enregistré [389363/389363]
```

Ensuite désarchivez le logiciel :

```
SLES12SP1:~ # tar xvf hello-2.1.1.tar.gz
hello-2.1.1/
hello-2.1.1/intl/
hello-2.1.1/intl/ChangeLog
hello-2.1.1/intl/Makefile.in
hello-2.1.1/intl/config.charset
```

```
hello-2.1.1/intl/locale.alias
hello-2.1.1/intl/ref-add.sin
hello-2.1.1/intl/ref-del.sin
hello-2.1.1/intl/gmo.h
hello-2.1.1/intl/gettextP.h
hello-2.1.1/intl/hash-string.h
hello-2.1.1/intl/plural-exp.h
hello-2.1.1/intl/eval-plural.h
hello-2.1.1/intl/os2compat.h
hello-2.1.1/intl/libguintl.h
hello-2.1.1/intl/loadinfo.h
hello-2.1.1/intl/bindtextdom.c
hello-2.1.1/intl/dcgettext.c
hello-2.1.1/intl/dgettext.c
hello-2.1.1/intl/gettext.c
hello-2.1.1/intl/finddomain.c
hello-2.1.1/intl/loadmsgcat.c
hello-2.1.1/intl/localealias.c
hello-2.1.1/intl/textdomain.c
hello-2.1.1/intl/l10nflist.c
hello-2.1.1/intl/explodename.c
hello-2.1.1/intl/dcigettext.c
hello-2.1.1/intl/dcngettext.c
hello-2.1.1/intl/dngettext.c
hello-2.1.1/intl/ngettext.c
hello-2.1.1/intl/plural.y
hello-2.1.1/intl/plural-exp.c
hello-2.1.1/intl/localcharset.c
hello-2.1.1/intl/localename.c
hello-2.1.1/intl/osdep.c
hello-2.1.1/intl/os2compat.c
hello-2.1.1/intl/intl-compat.c
hello-2.1.1/intl/plural.c
hello-2.1.1/intl/VERSION
```

```
hello-2.1.1/po/  
hello-2.1.1/po/Makefile.in.in  
hello-2.1.1/po/Makevars  
hello-2.1.1/po/remove-potcdate.sin  
hello-2.1.1/po/quot.sed  
hello-2.1.1/po/boldquot.sed  
hello-2.1.1/po/en@quot.header  
hello-2.1.1/po/en@boldquot.header  
hello-2.1.1/po/insert-header.sin  
hello-2.1.1/po/Rules-quot  
hello-2.1.1/po/POTFILES.in  
hello-2.1.1/po/hello.pot  
hello-2.1.1/po/ca.po  
hello-2.1.1/po/da.po  
hello-2.1.1/po/de.po  
hello-2.1.1/po/de_DE.po  
hello-2.1.1/po/el.po  
hello-2.1.1/po/eo.po  
hello-2.1.1/po/es.po  
hello-2.1.1/po/et.po  
hello-2.1.1/po/fi.po  
hello-2.1.1/po/fr.po  
hello-2.1.1/po/gl.po  
hello-2.1.1/po/he.po  
hello-2.1.1/po/hr.po  
hello-2.1.1/po/hu.po  
hello-2.1.1/po/id.po  
hello-2.1.1/po/it.po  
hello-2.1.1/po/ja.po  
hello-2.1.1/po/ko.po  
hello-2.1.1/po/lv.po  
hello-2.1.1/po/nb.po  
hello-2.1.1/po/nl.po  
hello-2.1.1/po/nn.po
```

```
hello-2.1.1/po/pl.po
hello-2.1.1/po/pt.po
hello-2.1.1/po/pt_BR.po
hello-2.1.1/po/ru.po
hello-2.1.1/po/sk.po
hello-2.1.1/po/sl.po
hello-2.1.1/po/sv.po
hello-2.1.1/po/tr.po
hello-2.1.1/po/uk.po
hello-2.1.1/po/ca.gmo
hello-2.1.1/po/da.gmo
hello-2.1.1/po/de.gmo
hello-2.1.1/po/de_DE.gmo
hello-2.1.1/po/el.gmo
hello-2.1.1/po/eo.gmo
hello-2.1.1/po/es.gmo
hello-2.1.1/po/et.gmo
hello-2.1.1/po/fi.gmo
hello-2.1.1/po/fr.gmo
hello-2.1.1/po/gl.gmo
hello-2.1.1/po/he.gmo
hello-2.1.1/po/hr.gmo
hello-2.1.1/po/hu.gmo
hello-2.1.1/po/id.gmo
hello-2.1.1/po/it.gmo
hello-2.1.1/po/ja.gmo
hello-2.1.1/po/ko.gmo
hello-2.1.1/po/lv.gmo
hello-2.1.1/po/nb.gmo
hello-2.1.1/po/nl.gmo
hello-2.1.1/po/nn.gmo
hello-2.1.1/po/pl.gmo
hello-2.1.1/po/pt.gmo
hello-2.1.1/po/pt_BR.gmo
```

```
hello-2.1.1/po/ru.gmo
hello-2.1.1/po/sk.gmo
hello-2.1.1/po/sl.gmo
hello-2.1.1/po/sv.gmo
hello-2.1.1/po/tr.gmo
hello-2.1.1/po/uk.gmo
hello-2.1.1/po/ChangeLog
hello-2.1.1/po/LINGUAS
hello-2.1.1/README
hello-2.1.1/ABOUT-NLS
hello-2.1.1/AUTHORS
hello-2.1.1/COPYING
hello-2.1.1/ChangeLog
hello-2.1.1/INSTALL
hello-2.1.1/Makefile.am
hello-2.1.1/Makefile.in
hello-2.1.1/NEWS
hello-2.1.1/THANKS
hello-2.1.1/TODO
hello-2.1.1/aclocal.m4
hello-2.1.1/config.guess
hello-2.1.1/config.h.in
hello-2.1.1/config.rpath
hello-2.1.1/config.sub
hello-2.1.1/configure
hello-2.1.1/configure.ac
hello-2.1.1/depcomp
hello-2.1.1/install-sh
hello-2.1.1/missing
hello-2.1.1/mkinstalldirs
hello-2.1.1/BUGS
hello-2.1.1/ChangeLog.0
hello-2.1.1/contrib/
hello-2.1.1/contrib/ChangeLog
```

```
hello-2.1.1/contrib/Makefile.am
hello-2.1.1/contrib/Makefile.in
hello-2.1.1/contrib/de_franconian_po.txt
hello-2.1.1/contrib/evolution.txt
hello-2.1.1/contrib/hello.1
hello-2.1.1/doc/
hello-2.1.1/doc/gpl.texi
hello-2.1.1/doc/ChangeLog
hello-2.1.1/doc/Makefile.am
hello-2.1.1/doc/Makefile.in
hello-2.1.1/doc/mdate-sh
hello-2.1.1/doc/stamp-vti
hello-2.1.1/doc/texinfo.tex
hello-2.1.1/doc/version.texi
hello-2.1.1/doc/hello.texi
hello-2.1.1/doc/hello.info
hello-2.1.1/src/
hello-2.1.1/src/ChangeLog
hello-2.1.1/src/Makefile.am
hello-2.1.1/src/Makefile.in
hello-2.1.1/src/alloca.c
hello-2.1.1/src/hello.c
hello-2.1.1/src/version.c
hello-2.1.1/src/getopt.c
hello-2.1.1/src/getopt1.c
hello-2.1.1/src/getopt.h
hello-2.1.1/src/system.h
hello-2.1.1/man/
hello-2.1.1/man/ChangeLog
hello-2.1.1/man/Makefile.am
hello-2.1.1/man/Makefile.in
hello-2.1.1/man/hello.1
hello-2.1.1/man/help2man
hello-2.1.1/m4/
```

```
hello-2.1.1/m4/README
hello-2.1.1/m4/ChangeLog
hello-2.1.1/m4/Makefile.am
hello-2.1.1/m4/Makefile.in
hello-2.1.1/m4/codeset.m4
hello-2.1.1/m4/gettext.m4
hello-2.1.1/m4/glibc21.m4
hello-2.1.1/m4/iconv.m4
hello-2.1.1/m4/isc-posix.m4
hello-2.1.1/m4/lcmessage.m4
hello-2.1.1/m4/lib-ld.m4
hello-2.1.1/m4/lib-link.m4
hello-2.1.1/m4/lib-prefix.m4
hello-2.1.1/m4/progtest.m4
hello-2.1.1/tests/
hello-2.1.1/tests/ChangeLog
hello-2.1.1/tests/Makefile.am
hello-2.1.1/tests/Makefile.in
hello-2.1.1/tests/hello-1
hello-2.1.1/tests/world-1
hello-2.1.1/tests/nothing-1
```

Changez de répertoire :

```
SLES12SP1:~ # cd hello-2.1.1/
SLES12SP1:~/hello-2.1.1 #
```

A l'étude du fichier **hello-2.1.1/README**, celui-ci nous renvoie vers le fichier **hello-2.1.1/INSTALL**. Visualisez donc ce dernier :

```
SLES12SP1:~/hello-2.1.1 # more INSTALL
Copyright 1994, 1995, 1996, 1999, 2000, 2001 Free Software Foundation,
Inc.
```

```
This file is free documentation; the Free Software Foundation gives
```

unlimited permission to copy, distribute and modify it.

## Basic Installation

=====

These are generic installation instructions.

The ``configure`` shell script attempts to guess correct values for various system-dependent variables used during compilation. It uses those values to create a ``Makefile`` in each directory of the package. It may also create one or more ``.h`` files containing system-dependent definitions. Finally, it creates a shell script ``config.status`` that you can run in the future to recreate the current configuration, and a file ``config.log`` containing compiler output (useful mainly for debugging ``configure``).

It can also use an optional file (typically called ``config.cache`` and enabled with ```--cache-file=config.cache`` or simply ```-C``) that saves the results of its tests to speed up reconfiguring. (Caching is disabled by default to prevent problems with accidental use of stale cache files.)

If you need to do unusual things to compile the package, please try to figure out how ``configure`` could check whether to do them, and mail diffs or instructions to the address given in the ``README`` so they can be considered for the next release. If you are using the cache, and at some point ``config.cache`` contains results you don't want to keep, you may remove or edit it.

The file ``configure.ac`` (or ``configure.in``) is used to create ``configure`` by a program called ``autoconf``. You only need  
--More--(16%)

La procédure expliquée est celle utilisée pour la plupart des installations manuelles, à savoir la saisie des quatre commandes suivantes.

## ./configure



**Important** : **configure** est un script chargé de créer les **makefiles** pour une architecture donnée. Les **makefiles** sont lus par la commande **make**.

```
SUSE12SP1:~/hello-2.1.1 # ./configure
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for gawk... gawk
checking whether make sets ${MAKE}... yes
checking for gcc... gcc
checking for C compiler default output... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g... yes
checking for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking for strerror in -lcposix... no
checking how to run the C preprocessor... gcc -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
```

```
checking for unistd.h... yes
checking for string.h... (cached) yes
checking for fcntl.h usability... yes
checking for fcntl.h presence... yes
checking for fcntl.h... yes
checking for sys/file.h usability... yes
checking for sys/file.h presence... yes
checking for sys/file.h... yes
checking for sys/param.h usability... yes
checking for sys/param.h presence... yes
checking for sys/param.h... yes
checking for working alloca.h... yes
checking for alloca... yes
checking for struct stat.st_blksize... yes
checking for msgfmt... /usr/bin/msgfmt
checking for gmsgfmt... /usr/bin/msgfmt
checking for xgettext... no
checking for msgmerge... no
checking build system type... x86_64-suse-linux
checking host system type... x86_64-suse-linux
checking for ranlib... ranlib
checking for gcc option to accept ANSI C... none needed
checking for an ANSI C-conforming const... yes
checking for inline... inline
checking for off_t... yes
checking for size_t... yes
checking for stdlib.h... (cached) yes
checking for unistd.h... (cached) yes
checking for getpagesize... yes
checking for working mmap... yes
checking whether we are using the GNU C Library 2.1 or newer... yes
checking for ld used by GCC... /usr/x86_64-suse-linux/bin/ld
checking if the linker (/usr/x86_64-suse-linux/bin/ld) is GNU ld... yes
checking for shared library run path origin... done
```

```
checking for iconv... yes
checking argz.h usability... yes
checking argz.h presence... yes
checking for argz.h... yes
checking limits.h usability... yes
checking limits.h presence... yes
checking for limits.h... yes
checking locale.h usability... yes
checking locale.h presence... yes
checking for locale.h... yes
checking nl_types.h usability... yes
checking nl_types.h presence... yes
checking for nl_types.h... yes
checking malloc.h usability... yes
checking malloc.h presence... yes
checking for malloc.h... yes
checking stddef.h usability... yes
checking stddef.h presence... yes
checking for stddef.h... yes
checking for stdlib.h... (cached) yes
checking for string.h... (cached) yes
checking for unistd.h... (cached) yes
checking for sys/param.h... (cached) yes
checking for feof_unlocked... yes
checking for fgets_unlocked... yes
checking for getc_unlocked... yes
checking for getcwd... yes
checking for getegid... yes
checking for geteuid... yes
checking for getgid... yes
checking for getuid... yes
checking for mempcpy... yes
checking for munmap... yes
checking for putenv... yes
```

```
checking for setenv... yes
checking for setlocale... yes
checking for stpcpy... yes
checking for strcasecmp... yes
checking for strdup... yes
checking for strtoul... yes
checking for tsearch... yes
checking for __argz_count... yes
checking for __argz_stringify... yes
checking for __argz_next... yes
checking for iconv declaration...
    extern size_t iconv (iconv_t cd, char * *inbuf, size_t *inbytesleft, char * *outbuf, size_t
*outbytesleft);
checking for nl_langinfo and CODESET... yes
checking for LC_MESSAGES... yes
checking for bison... no
checking whether NLS is requested... yes
checking whether included gettext is requested... no
checking for GNU gettext in libc... yes
checking for perl... perl
configure: creating ./config.status
config.status: creating Makefile
config.status: creating contrib/Makefile
config.status: creating doc/Makefile
config.status: creating intl/Makefile
config.status: creating man/Makefile
config.status: creating po/Makefile.in
config.status: creating m4/Makefile
config.status: creating src/Makefile
config.status: creating tests/Makefile
config.status: creating config.h
config.status: executing depfiles commands
config.status: executing default-1 commands
config.status: creating po/POTFILES
```

```
config.status: creating po/Makefile
config.status: executing default commands
```

## make



**Important :** **make** sert à appeler des commandes créant des fichiers nécessaires à l'installation du logiciel.

```
SUSE12SP1:~/hello-2.1.1 # make
make all-recursive
make[1]: Entering directory '/root/hello-2.1.1'
Making all in contrib
make[2]: Entering directory '/root/hello-2.1.1/contrib'
make[2]: Nothing to be done for 'all'.
make[2]: Leaving directory '/root/hello-2.1.1/contrib'
Making all in doc
make[2]: Entering directory '/root/hello-2.1.1/doc'
make[2]: Nothing to be done for 'all'.
make[2]: Leaving directory '/root/hello-2.1.1/doc'
Making all in intl
make[2]: Entering directory '/root/hello-2.1.1/intl'
make[2]: Nothing to be done for 'all'.
make[2]: Leaving directory '/root/hello-2.1.1/intl'
Making all in po
make[2]: Entering directory '/root/hello-2.1.1/po'
make[2]: Nothing to be done for 'all'.
make[2]: Leaving directory '/root/hello-2.1.1/po'
Making all in src
make[2]: Entering directory '/root/hello-2.1.1/src'
source='hello.c' object='hello.o' libtool=no \
depfile='.deps/hello.Po' tmpdepfile='.deps/hello.TPo' \
```

```
depmode=gcc3 /bin/sh ../depcomp \  
gcc -DLOCALEDIR=\"/usr/local/share/locale\" -DHAVE_CONFIG_H -I. -I. -I.. -I. -I. -I.. -I../intl -I../intl -g -  
02 -c `test -f 'hello.c' || echo './`hello.c  
source='version.c' object='version.o' libtool=no \  
depfile='.deps/version.Po' tmpdepfile='.deps/version.TPo' \  
depmode=gcc3 /bin/sh ../depcomp \  
gcc -DLOCALEDIR=\"/usr/local/share/locale\" -DHAVE_CONFIG_H -I. -I. -I.. -I. -I. -I.. -I../intl -I../intl -g -  
02 -c `test -f 'version.c' || echo './`version.c  
source='getopt.c' object='getopt.o' libtool=no \  
depfile='.deps/getopt.Po' tmpdepfile='.deps/getopt.TPo' \  
depmode=gcc3 /bin/sh ../depcomp \  
gcc -DLOCALEDIR=\"/usr/local/share/locale\" -DHAVE_CONFIG_H -I. -I. -I.. -I. -I. -I.. -I../intl -I../intl -g -  
02 -c `test -f 'getopt.c' || echo './`getopt.c  
source='getopt1.c' object='getopt1.o' libtool=no \  
depfile='.deps/getopt1.Po' tmpdepfile='.deps/getopt1.TPo' \  
depmode=gcc3 /bin/sh ../depcomp \  
gcc -DLOCALEDIR=\"/usr/local/share/locale\" -DHAVE_CONFIG_H -I. -I. -I.. -I. -I. -I.. -I../intl -I../intl -g -  
02 -c `test -f 'getopt1.c' || echo './`getopt1.c  
gcc -g -O2 -o hello hello.o version.o getopt.o getopt1.o  
make[2]: Leaving directory '/root/hello-2.1.1/src'  
Making all in man  
make[2]: Entering directory '/root/hello-2.1.1/man'  
perl help2man --name="Friendly Greeting Program" ../src/hello >hello.1  
make[2]: Leaving directory '/root/hello-2.1.1/man'  
Making all in m4  
make[2]: Entering directory '/root/hello-2.1.1/m4'  
make[2]: Nothing to be done for 'all'.  
make[2]: Leaving directory '/root/hello-2.1.1/m4'  
Making all in tests  
make[2]: Entering directory '/root/hello-2.1.1/tests'  
make[2]: Nothing to be done for 'all'.  
make[2]: Leaving directory '/root/hello-2.1.1/tests'  
make[2]: Entering directory '/root/hello-2.1.1'  
make[2]: Leaving directory '/root/hello-2.1.1'
```

```
make[1]: Leaving directory '/root/hello-2.1.1'
```

## make check



**Important** : **make check** permet de vérifier si la commande **make** a bien fonctionné.

```
SUSE12SP1:~/hello-2.1.1 # make check
Making check in contrib
make[1]: Entering directory '/root/hello-2.1.1/contrib'
make[1]: Nothing to be done for 'check'.
make[1]: Leaving directory '/root/hello-2.1.1/contrib'
Making check in doc
make[1]: Entering directory '/root/hello-2.1.1/doc'
make[1]: Nothing to be done for 'check'.
make[1]: Leaving directory '/root/hello-2.1.1/doc'
Making check in intl
make[1]: Entering directory '/root/hello-2.1.1/intl'
make[1]: Nothing to be done for 'check'.
make[1]: Leaving directory '/root/hello-2.1.1/intl'
Making check in po
make[1]: Entering directory '/root/hello-2.1.1/po'
make[1]: Nothing to be done for 'check'.
make[1]: Leaving directory '/root/hello-2.1.1/po'
Making check in src
make[1]: Entering directory '/root/hello-2.1.1/src'
make[1]: Nothing to be done for 'check'.
make[1]: Leaving directory '/root/hello-2.1.1/src'
Making check in man
make[1]: Entering directory '/root/hello-2.1.1/man'
make[1]: Nothing to be done for 'check'.
```

```
make[1]: Leaving directory '/root/hello-2.1.1/man'
Making check in m4
make[1]: Entering directory '/root/hello-2.1.1/m4'
make[1]: Nothing to be done for 'check'.
make[1]: Leaving directory '/root/hello-2.1.1/m4'
Making check in tests
make[1]: Entering directory '/root/hello-2.1.1/tests'
make check-TESTS
make[2]: Entering directory '/root/hello-2.1.1/tests'
PASS: hello-1
PASS: world-1
PASS: nothing-1
=====
All 3 tests passed
=====
make[2]: Leaving directory '/root/hello-2.1.1/tests'
make[1]: Leaving directory '/root/hello-2.1.1/tests'
make[1]: Entering directory '/root/hello-2.1.1'
make[1]: Leaving directory '/root/hello-2.1.1'
```

## make install



**Important** : **make install** sert à installer le logiciel.

```
SUSE12SP1:~/hello-2.1.1 # make install
Making install in contrib
make[1]: Entering directory '/root/hello-2.1.1/contrib'
make[2]: Entering directory '/root/hello-2.1.1/contrib'
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Nothing to be done for 'install-data-am'.
```

```
make[2]: Leaving directory '/root/hello-2.1.1/contrib'
make[1]: Leaving directory '/root/hello-2.1.1/contrib'
Making install in doc
make[1]: Entering directory '/root/hello-2.1.1/doc'
make[2]: Entering directory '/root/hello-2.1.1/doc'
make[2]: Nothing to be done for 'install-exec-am'.
/bin/sh ../mkinstalldirs /usr/local/info
mkdir -p -- /usr/local/info
  /usr/bin/install -c -m 644 ./hello.info /usr/local/info/hello.info
  install-info --info-dir=/usr/local/info /usr/local/info/hello.info
make[2]: Leaving directory '/root/hello-2.1.1/doc'
make[1]: Leaving directory '/root/hello-2.1.1/doc'
Making install in intl
make[1]: Entering directory '/root/hello-2.1.1/intl'
if test "hello" = "gettext" \
  && test '' = 'intl-compat.o'; then \
  /bin/sh `case "./mkinstalldirs" in /*) echo "./mkinstalldirs" ;; *) echo "../mkinstalldirs" ;; esac`
  /usr/local/lib /usr/local/include; \
  /usr/bin/install -c -m 644 libintl.h /usr/local/include/libintl.h; \
  @LIBTOOL@ --mode=install \
    /usr/bin/install -c -m 644 libintl.a /usr/local/lib/libintl.a; \
else \
  : ; \
fi
if test 'no' = yes; then \
  test yes != no || /bin/sh `case "./mkinstalldirs" in /*) echo "./mkinstalldirs" ;; *) echo "../mkinstalldirs" ;; esac`
  /usr/local/lib; \
  temp=/usr/local/lib/t-charset.alias; \
  dest=/usr/local/lib/charset.alias; \
  if test -f /usr/local/lib/charset.alias; then \
    orig=/usr/local/lib/charset.alias; \
    sed -f ref-add.sed $orig > $temp; \
    /usr/bin/install -c -m 644 $temp $dest; \
    rm -f $temp; \
```

```
else \  
  if test yes = no; then \  
    orig=charset.alias; \  
    sed -f ref-add.sed $orig > $temp; \  
    /usr/bin/install -c -m 644 $temp $dest; \  
    rm -f $temp; \  
  fi; \  
fi; \  
/bin/sh `case "./mkinstalldirs" in /*) echo "./mkinstalldirs" ;; *) echo ".././mkinstalldirs" ;; esac` \  
/usr/local/share/locale; \  
test -f /usr/local/share/locale/locale.alias \  
&& orig=/usr/local/share/locale/locale.alias \  
|| orig=./locale.alias; \  
temp=/usr/local/share/locale/t-locale.alias; \  
dest=/usr/local/share/locale/locale.alias; \  
sed -f ref-add.sed $orig > $temp; \  
/usr/bin/install -c -m 644 $temp $dest; \  
rm -f $temp; \  
else \  
  : ; \  
fi \  
if test "hello" = "gettext"; then \  
  /bin/sh `case "./mkinstalldirs" in /*) echo "./mkinstalldirs" ;; *) echo ".././mkinstalldirs" ;; esac` \  
/usr/local/share/gettext/intl; \  
  /usr/bin/install -c -m 644 VERSION /usr/local/share/gettext/intl/VERSION; \  
  /usr/bin/install -c -m 644 ChangeLog.inst /usr/local/share/gettext/intl/ChangeLog; \  
  dists="COPYING.LIB-2.0 COPYING.LIB-2.1 Makefile.in config.charset locale.alias ref-add.sin ref-del.sin gmo.h \  
gettextP.h hash-string.h plural-exp.h eval-plural.h os2compat.h libguintl.h loadinfo.h bindtextdom.c dcgettext.c \  
dgettext.c gettext.c finddomain.c loadmsgcat.c localealias.c textdomain.c l10nflist.c explodename.c dcigettext.c \  
dcngettext.c dngettext.c ngettext.c plural.y plural-exp.c localcharset.c localename.c osdep.c os2compat.c intl- \  
compat.c"; \  
  for file in $dists; do \  
    /usr/bin/install -c -m 644 ./ $file \  
      /usr/local/share/gettext/intl/$file; \  
  done
```

```
done; \  
  chmod a+x /usr/local/share/gettext/intl/config.charset; \  
  dists="plural.c"; \  
  for file in $dists; do \  
    if test -f $file; then dir=.; else dir=.; fi; \  
    /usr/bin/install -c -m 644 $dir/$file \  
      /usr/local/share/gettext/intl/$file; \  
  done; \  
  dists="xopen-msg.sed linux-msg.sed po2tbl.sed.in cat-compat.c COPYING.LIB-2 gettext.h libgettext.h plural-  
eval.c"; \  
  for file in $dists; do \  
    rm -f /usr/local/share/gettext/intl/$file; \  
  done; \  
else \  
  : ; \  
fi  
make[1]: Leaving directory '/root/hello-2.1.1/intl'  
Making install in po  
make[1]: Entering directory '/root/hello-2.1.1/po'  
/bin/sh `case ". /mkinstalldirs" in /*) echo ". /mkinstalldirs" ;; *) echo "../. /mkinstalldirs" ;; esac`  
/usr/local/share  
mkdir -p -- /usr/local/share/locale/ca/LC_MESSAGES  
installing ca.gmo as /usr/local/share/locale/ca/LC_MESSAGES/hello.mo  
mkdir -p -- /usr/local/share/locale/da/LC_MESSAGES  
installing da.gmo as /usr/local/share/locale/da/LC_MESSAGES/hello.mo  
mkdir -p -- /usr/local/share/locale/de/LC_MESSAGES  
installing de.gmo as /usr/local/share/locale/de/LC_MESSAGES/hello.mo  
mkdir -p -- /usr/local/share/locale/de_DE/LC_MESSAGES  
installing de_DE.gmo as /usr/local/share/locale/de_DE/LC_MESSAGES/hello.mo  
mkdir -p -- /usr/local/share/locale/el/LC_MESSAGES  
installing el.gmo as /usr/local/share/locale/el/LC_MESSAGES/hello.mo  
mkdir -p -- /usr/local/share/locale/eo/LC_MESSAGES  
installing eo.gmo as /usr/local/share/locale/eo/LC_MESSAGES/hello.mo  
mkdir -p -- /usr/local/share/locale/es/LC_MESSAGES
```

```
installing es.gmo as /usr/local/share/locale/es/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/et/LC_MESSAGES
installing et.gmo as /usr/local/share/locale/et/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/fi/LC_MESSAGES
installing fi.gmo as /usr/local/share/locale/fi/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/fr/LC_MESSAGES
installing fr.gmo as /usr/local/share/locale/fr/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/gl/LC_MESSAGES
installing gl.gmo as /usr/local/share/locale/gl/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/he/LC_MESSAGES
installing he.gmo as /usr/local/share/locale/he/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/hr/LC_MESSAGES
installing hr.gmo as /usr/local/share/locale/hr/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/hu/LC_MESSAGES
installing hu.gmo as /usr/local/share/locale/hu/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/id/LC_MESSAGES
installing id.gmo as /usr/local/share/locale/id/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/it/LC_MESSAGES
installing it.gmo as /usr/local/share/locale/it/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/ja/LC_MESSAGES
installing ja.gmo as /usr/local/share/locale/ja/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/ko/LC_MESSAGES
installing ko.gmo as /usr/local/share/locale/ko/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/lv/LC_MESSAGES
installing lv.gmo as /usr/local/share/locale/lv/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/nb/LC_MESSAGES
installing nb.gmo as /usr/local/share/locale/nb/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/nl/LC_MESSAGES
installing nl.gmo as /usr/local/share/locale/nl/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/nn/LC_MESSAGES
installing nn.gmo as /usr/local/share/locale/nn/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/pl/LC_MESSAGES
installing pl.gmo as /usr/local/share/locale/pl/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/pt/LC_MESSAGES
```

```
installing pt.gmo as /usr/local/share/locale/pt/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/pt_BR/LC_MESSAGES
installing pt_BR.gmo as /usr/local/share/locale/pt_BR/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/ru/LC_MESSAGES
installing ru.gmo as /usr/local/share/locale/ru/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/sk/LC_MESSAGES
installing sk.gmo as /usr/local/share/locale/sk/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/sl/LC_MESSAGES
installing sl.gmo as /usr/local/share/locale/sl/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/sv/LC_MESSAGES
installing sv.gmo as /usr/local/share/locale/sv/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/tr/LC_MESSAGES
installing tr.gmo as /usr/local/share/locale/tr/LC_MESSAGES/hello.mo
mkdir -p -- /usr/local/share/locale/uk/LC_MESSAGES
installing uk.gmo as /usr/local/share/locale/uk/LC_MESSAGES/hello.mo
if test "hello" = "gettext"; then \
  /bin/sh `case ". /mkinstalldirs" in /*) echo ". /mkinstalldirs" ;; *) echo "../ /mkinstalldirs" ;; esac`
  /usr/local/share/gettext/po; \
  for file in Makefile.in.in Makevars remove-potcdate.sin quot.sed boldquot.sed en@quot.header en@boldquot.header
insert-header.sin Rules-quot ; do \
  /usr/bin/install -c -m 644 ./ $file \
    /usr/local/share/gettext/po/$file; \
done; \
else \
: ; \
fi
make[1]: Leaving directory '/root/hello-2.1.1/po'
Making install in src
make[1]: Entering directory '/root/hello-2.1.1/src'
make[2]: Entering directory '/root/hello-2.1.1/src'
/bin/sh ../mkinstalldirs /usr/local/bin
  /usr/bin/install -c hello /usr/local/bin/hello
make[2]: Nothing to be done for 'install-data-am'.
make[2]: Leaving directory '/root/hello-2.1.1/src'
```

```
make[1]: Leaving directory '/root/hello-2.1.1/src'
Making install in man
make[1]: Entering directory '/root/hello-2.1.1/man'
make[2]: Entering directory '/root/hello-2.1.1/man'
make[2]: Nothing to be done for 'install-exec-am'.
/bin/sh ../mkinstalldirs /usr/local/man/man1
/usr/bin/install -c -m 644 ./hello.1 /usr/local/man/man1/hello.1
make[2]: Leaving directory '/root/hello-2.1.1/man'
make[1]: Leaving directory '/root/hello-2.1.1/man'
Making install in m4
make[1]: Entering directory '/root/hello-2.1.1/m4'
make[2]: Entering directory '/root/hello-2.1.1/m4'
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Nothing to be done for 'install-data-am'.
make[2]: Leaving directory '/root/hello-2.1.1/m4'
make[1]: Leaving directory '/root/hello-2.1.1/m4'
Making install in tests
make[1]: Entering directory '/root/hello-2.1.1/tests'
make[2]: Entering directory '/root/hello-2.1.1/tests'
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Nothing to be done for 'install-data-am'.
make[2]: Leaving directory '/root/hello-2.1.1/tests'
make[1]: Leaving directory '/root/hello-2.1.1/tests'
make[1]: Entering directory '/root/hello-2.1.1'
make[2]: Entering directory '/root/hello-2.1.1'
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Nothing to be done for 'install-data-am'.
make[2]: Leaving directory '/root/hello-2.1.1'
make[1]: Leaving directory '/root/hello-2.1.1'
```

Il convient maintenant de tester le nouveau logiciel :

```
SUSE12SP1:~/hello-2.1.1 # hello
```

```
Hello, world!
```

Le logiciel hello a été correctement installé.

## La commande rpm



**A faire** - Placez-vous dans le répertoire personnel de **root** grâce à la commande **cd ~**.

Afin de faciliter l'installation, la désinstallation et la gestion des logiciels (appelés paquets), CentOS et Red Hat utilisent un format de fichier de logiciels installables spécifique. Celui-ci s'appelle **RPM** pour Red Hat Package Manager. La commande utilisée pour manipuler ses paquets s'appelle aussi **rpm**.

Les options de la commande rpm sont :

```
SUSE12SP1:~ # cd ~
SUSE12SP1:~ # rpm --help
Usage: rpm [OPTION...]

Query/Verify package selection options:
-a, --all                query/verify all packages
-f, --file               query/verify package(s) owning file
-g, --group              query/verify package(s) in group
-p, --package           query/verify a package file
  --pkgid                query/verify package(s) with package identifier
  --hdrid                query/verify package(s) with header identifier
  --triggeredby          query the package(s) triggered by the package
  --whatrequires          query/verify the package(s) which require a dependency
  --whatprovides          query/verify the package(s) which provide a dependency
  --nomanifest           do not process non-package files as manifests

Query options (with -q or --query):
```

```
-c, --configfiles    list all configuration files
-d, --docfiles       list all documentation files
-L, --licensefiles  list all license files
  --dump             dump basic file information
-l, --list           list files in package
  --queryformat=QUERYFORMAT use the following query format
-s, --state          display the states of the listed files
```

Verify options (with -V or --verify):

```
--nofiledigest      don't verify digest of files
--nofiles           don't verify files in package
--nodeps            don't verify package dependencies
--noscript          don't execute verify script(s)
```

Install/Upgrade/Erase options:

```
--allfiles          install all files, even configurations which might otherwise be skipped
--allmatches        remove all packages which match <package> (normally an error is generated if
<package> specified
multiple packages)
--badreloc          relocate files in non-relocatable package
-e, --erase=<package>+ erase (uninstall) package
--excludedocs       do not install documentation
--excludepath=<path> skip files with leading component <path>
--force             short hand for --replacepkgs --replacefiles
-F, --freshen=<packagefile>+ upgrade package(s) if already installed
-h, --hash          print hash marks as package installs (good with -v)
--ignorearch        don't verify package architecture
--ignoreos          don't verify package operating system
--ignoresize        don't check disk space before installing
-i, --install       install package(s)
--justdb            update the database, but do not modify the filesystem
--nodeps            do not verify package dependencies
--nofiledigest      don't verify digest of files
--nocontexts        don't install file security contexts
```

```
--noorder          do not reorder package installation to satisfy dependencies
--noscripts        do not execute package scriptlet(s)
--notriggers       do not execute any scriptlet(s) triggered by this package
--nocollections    do not perform any collection actions
--oldpackage       upgrade to an old version of the package (--force on upgrades does this
automatically)
--percent          print percentages as package installs
--prefix=<dir>     relocate the package to <dir>, if relocatable
--relocate=<old>=<new> relocate files from path <old> to <new>
--replacefiles     ignore file conflicts between packages
--replacepkgs      reinstall if the package is already present
--test            don't install, but tell if it would work or not
-U, --upgrade=<packagefile>+ upgrade package(s)
```

Common options for all rpm modes and executables:

```
-D, --define='MACRO EXPR'  define MACRO with value EXPR
--undefine=MACRO          undefine MACRO
-E, --eval='EXPR'         print macro expansion of EXPR
--macros=<FILE:...>       read <FILE:...> instead of default file(s)
--nodigest                don't verify package digest(s)
--nosignature             don't verify package signature(s)
--rcfile=<FILE:...>       read <FILE:...> instead of default file(s)
-r, --root=ROOT           use ROOT as top level directory (default: "/")
--dbpath=DIRECTORY        use database in DIRECTORY
--querytags               display known query tags
--showrc                  display final rpmrc and macro configuration
--quiet                   provide less detailed output
-v, --verbose              provide more detailed output
--version                 print the version of rpm being used
```

Options implemented via popt alias/exec:

```
--scripts            list install/erase scriptlets from package(s)
--setperms            set permissions of files in a package
--setugids            set user/group ownership of files in a package
```

```
--conflicts      list capabilities this package conflicts with
--obsoletes      list other packages removed by installing this package
--provides       list capabilities that this package provides
--requires       list capabilities required by package(s)
--recommends     list capabilities recommended by package(s)
--suggests       list capabilities suggested by package(s)
--supplements    list capabilities supplemented by package(s)
--enhances       list capabilities enhanced by package(s)
--info           list descriptive information from package(s)
--changelog      list change logs for this package
--xml            list metadata in xml
--triggers       list trigger scriptlets from package(s)
--last           list package(s) by install time, most recent first
--duplicates     list duplicated packages
--filesbypkg     list all files from each package
--fileclass      list file names with classes
--filecolor      list file names with colors
--fscontext      list file names with security context from file system
--fileprovide    list file names with provides
--filerequire    list file names with requires
--filecaps       list file names with POSIX1.e capabilities
```

#### Help options:

```
  -?, --help      Show this help message
  --usage         Display brief usage message
```

## Configuration

Le fichier de configuration principal de la commande rpm est **/usr/lib/rpm/rpmrc** :

```
SUSE12SP1:~ # cat /usr/lib/rpm/rpmrc
#/*! \page config_rpmrc Default configuration: /usr/lib/rpm/rpmrc
```

```
# \verbatim
#
# This is a global RPM configuration file. All changes made here will
# be lost when the rpm package is upgraded. Any per-system configuration
# should be added to /etc/rpmrc, while per-user configuration should
# be added to ~/.rpmrc.
#
#####
# Values for RPM_OPT_FLAGS for various platforms

# "fat" binary with both archs, for Darwin
optflags: fat -O2 -g -arch i386 -arch ppc

optflags: i386 -O2 -g -m32 -march=i486 -fmessage-length=0 -D_FORTIFY_SOURCE=2 -fstack-protector -funwind-tables -
fasynchronous-unwind-tables
optflags: i486 -O2 -g -m32 -march=i486 -fmessage-length=0 -D_FORTIFY_SOURCE=2 -fstack-protector -funwind-tables -
fasynchronous-unwind-tables
optflags: i586 -O2 -g -m32 -march=i586 -mtune=i686 -fmessage-length=0 -D_FORTIFY_SOURCE=2 -fstack-protector -
funwind-tables -fasynchronous-unwind-tables
optflags: i686 -O2 -g -m32 -march=i686 -mtune=i686 -fmessage-length=0 -D_FORTIFY_SOURCE=2 -fstack-protector -
funwind-tables -fasynchronous-unwind-tables
optflags: pentium3 -O2 -g -m32 -march=pentium3
optflags: pentium4 -O2 -g -m32 -march=pentium4
optflags: athlon -O2 -g -m32 -march=athlon
optflags: geode -Os -g -m32 -march=geode
optflags: ia64 -O2 -g -fmessage-length=0 -D_FORTIFY_SOURCE=2 -fstack-protector -funwind-tables -fasynchronous-
unwind-tables
optflags: x86_64 -O2 -g -m64 -fmessage-length=0 -D_FORTIFY_SOURCE=2 -fstack-protector -funwind-tables -
fasynchronous-unwind-tables
optflags: amd64 -O2 -g
optflags: ia32e -O2 -g
...
```

Les directives indiquent comment optimiser la construction d'un rpm en fonction du type de processeur retourné par la commande **uname -p**. Par

exemple, la directive **buildarchtranslate: athlon: i586** indique que le processus doit utiliser les optimisations **i586** lors de la construction d'un `src.rpm` sur une architecture **athlon**. Si au contraire il est souhaité que les optimisations **athlon** soient utilisées, il convient d'inclure la ligne **buildarchtranslate: athlon: athlon** dans le fichier `/etc/rpmrc`. En effet lors de la mise à jour du paquet rpm, le fichier `/usr/lib/rpm/rpmrc` est écrasé. Toute modification des directives de ce fichier doivent être inscrites dans `/etc/rpmrc` ou dans un fichier `~/.rpmrc` spécifique à un utilisateur.

## Utilisation

Afin de connaître la liste des paquets installés sur la machine, il convient de saisir la commande suivante dans une console en tant que root :

```
SUSE12SP1:~ # rpm -qa | more
deltarpm-3.6-3.58.x86_64
yelp-lang-3.10.2-1.20.noarch
hwinfo-21.23-1.13.x86_64
python3-speechd-0.8-7.9.x86_64
libzio1-1.00-9.188.x86_64
libgudev-1_0-0-210-83.2.x86_64
libnl-config-3.2.23-2.21.noarch
iso_ent-2000.11.03-826.7.noarch
gnome-control-center-3.10.3-17.1.x86_64
bash-completion-2.1-4.15.noarch
libgsttag-1_0-0-1.2.4-1.124.x86_64
cpupower-3.13-8.2.x86_64
Mesa-libEGL1-10.0.2-90.17.x86_64
yast2-trans-en_GB-3.0.0-36.1.noarch
libtiff5-32bit-4.0.4-12.2.x86_64
gnome-tweak-tool-3.10.1-5.18.noarch
xvinfo-1.1.2-1.16.x86_64
yast2-pam-3.1.1-1.264.noarch
libpyglib-gi-2_0-python3-0-3.10.2-3.5.x86_64
smartmontools-6.2-4.33.x86_64
patterns-sles-documentation-32bit-12-64.3.x86_64
libboost_regex1_54_0-1.54.0-13.1.x86_64
libitm1-5.2.1+r226025-4.1.x86_64
```

```
python3-3.4.1-12.1.x86_64
yast2-control-center-3.1.3-1.15.x86_64
libarchive13-3.1.2-9.1.x86_64
haveged-1.9.1-14.2.x86_64
zip-3.0-15.18.x86_64
xkbcomp-1.2.4-9.59.x86_64
which-2.20-3.180.x86_64
libgcr-3-1-3.10.1-1.187.x86_64
libmozjs-17_0-17.0-8.1.x86_64
sysconfig-0.83.8-7.1.x86_64
master-boot-code-1.22-16.27.x86_64
bind-libs-32bit-9.9.6P1-30.2.x86_64
--More--
```

Afin de connaître le nombre total de paquets installés sur la machine, utilisez la commande suivante :

```
SUSE12SP1:~ # rpm -qa | wc -l
1592
```

Imaginons maintenant que vous souhaitez vérifier si un paquet contenant la chaîne de caractères **setup** soit déjà installé sur la machine. Dans ce cas, il convient d'utiliser la commande suivante :

```
SUSE12SP1:~ # rpm -qa | grep setup
libcryptsetup4-1.6.4-2.10.x86_64
cryptsetup-1.6.4-2.10.x86_64
libcryptsetup4-32bit-1.6.4-2.10.x86_64
```

Afin de connaître les détails du paquet **cryptsetup**, il convient de saisir la commande suivante :

```
SUSE12SP1:~ # rpm -qi cryptsetup
Name      : cryptsetup
Version   : 1.6.4
Release   : 2.10
Architecture: x86_64
```

```
Install Date: Sun May 1 15:17:28 2016
Group       : System/Base
Size        : 647221
License     : SUSE-GPL-2.0-with-openssl-exception and LGPL-2.0+
Signature   : RSA/SHA256, Mon Sep 22 13:52:09 2014, Key ID 70af9e8139db7c82
Source RPM  : cryptsetup-1.6.4-2.10.src.rpm
Build Date  : Mon Sep 22 13:51:47 2014
Build Host  : sheep08
Relocations : (not relocatable)
Packager    : https://www.suse.com/
Vendor      : SUSE LLC <https://www.suse.com/>
URL         : http://code.google.com/p/cryptsetup/
Summary     : Set Up dm-crypt Based Encrypted Block Devices
Description :
cryptsetup is used to conveniently set up dm-crypt based device-mapper
targets. It allows to set up targets to read cryptoloop compatible
volumes as well as LUKS formatted ones. The package additionally
includes support for automatically setting up encrypted volumes at boot
time via the config file /etc/crypttab.
Distribution: SUSE Linux Enterprise 12
```

Afin de lister tous les fichiers installés par le paquet concerné, utilisez la commande suivante :

```
SUSE12SP1:~ # rpm -ql cryptsetup
/sbin/cryptsetup
/usr/sbin/cryptsetup
/usr/sbin/cryptsetup-reencrypt
/usr/sbin/veritysetup
/usr/share/locale/cs/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/de/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/es/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/fi/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/fr/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/id/LC_MESSAGES/cryptsetup.mo
```

```
/usr/share/locale/it/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/nl/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/pl/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/sv/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/uk/LC_MESSAGES/cryptsetup.mo
/usr/share/locale/vi/LC_MESSAGES/cryptsetup.mo
/usr/share/man/man8/cryptsetup-reencrypt.8.gz
/usr/share/man/man8/cryptsetup.8.gz
/usr/share/man/man8/veritysetup.8.gz
```

A l'inverse, si vous connaissez le nom d'un fichier et vous souhaitez savoir quel paquet l'a installé, utilisez la commande suivante :

```
SUSE12SP1:~ # rpm -qf /sbin/cryptsetup
cryptsetup-1.6.4-2.10.x86_64
```

Pour connaître les fichiers modifiés depuis l'installation d'un paquetage, utilisez la commande suivante :

```
# rpm -qV packet
```

Dans le cas où aucun fichier n'a été modifié, le console n'affiche rien. Dans le cas où les fichiers ont été modifiés, le système vous indique, fichier par fichier, les modifications apportées selon le tableau ci-dessous :

<b>Lettre ou mot Clé</b>	<b>Description</b>
5	Contrôle MD5
S	Taille du fichier
L	Lien symbolique
T	Date de modification
D	Périphérique
U	Utilisateur propriétaire
G	Groupe propriétaire
M	Droits d'accès
?	Fichier illisible
Manquant	Fichier manquant



**Important** : Un paquet rpm est un fichier cpio modifié. Pour pouvoir extraire le contenu d'un src.rpm et explorer l'arborescence utilisé pour construire le paquet, utilisez la commande **rpm2cpio paquet.src.rpm | cpio -i -make-directories**

## La commande zypper

**zypper** est le nom d'un programme utilitaire de gestion de paquets utilisé par **SLES** et **openSUSE**.

Il permet de gérer l'installation et la mise à jour des logiciels installés. C'est une surcouche à RPM gérant les téléchargements et les dépendances, de la même manière que **APT** de Debian, **Urpmi** de Mandriva ou **yum** de Redhat.

La commande zypper prend la forme suivante :

```
# zypper [--options-globales] <commande> [--options-commande] [arguments] [Entrée]
```

Les options et commandes de zypper sont :

```
SUSE12SP1:~ # zypper --help
Usage:
  zypper [--global-options] <command> [--command-options] [arguments]
  zypper <subcommand> [--command-options] [arguments]

Global Options:
  --help, -h           Help.
  --version, -V        Output the version number.
  --promptids          Output a list of zypper's user prompts.
  --config, -c <file> Use specified config file instead of the default.
  --userdata <string> User defined transaction id used in history and plugins.
  --quiet, -q          Suppress normal output, print only error
                      messages.
```

```
--verbose, -v          Increase verbosity.
--[no-]color          Whether to use colors in output if tty supports it.
--no-abbrev, -A       Do not abbreviate text in tables.
--table-style, -s     Table style (integer).
--non-interactive, -n Do not ask anything, use default answers
                    automatically.
--non-interactive-include-reboot-patches
                    Do not treat patches as interactive, which have
                    the rebootSuggested-flag set.
--xmlout, -x          Switch to XML output.
--ignore-unknown, -i  Ignore unknown packages.

--reposd-dir, -D <dir> Use alternative repository definition file
                    directory.
--cache-dir, -C <dir>  Use alternative directory for all caches.
--raw-cache-dir <dir>  Use alternative raw meta-data cache directory.
--solv-cache-dir <dir> Use alternative solv file cache directory.
--pkg-cache-dir <dir>  Use alternative package cache directory.

Repository Options:
--no-gpg-checks       Ignore GPG check failures and continue.
--gpg-auto-import-keys
                    Automatically trust and import new repository
                    signing keys.
--plus-repo, -p <URI> Use an additional repository.
--plus-content <tag>  Additionally use disabled repositories providing a specific keyword.
                    Try '--plus-content debug' to enable repos indicating to provide debug packages.
--disable-repositories
                    Do not read meta-data from repositories.
--no-refresh          Do not refresh the repositories.
--no-cd               Ignore CD/DVD repositories.
--no-remote           Ignore remote repositories.
--releasever          Set the value of $releasever in all .repo files (default: distribution version)

Target Options:
--root, -R <dir>     Operate on a different root directory.
```

```
--disable-system-resolvables
    Do not read installed packages.
```

#### Commands:

```
help, ?          Print help.
shell, sh        Accept multiple commands at once.
```

#### Repository Management:

```
repos, lr        List all defined repositories.
addrepo, ar      Add a new repository.
removerepon, rr  Remove specified repository.
renamerepon, nr  Rename specified repository.
modifyrepo, mr   Modify specified repository.
refresh, ref     Refresh all repositories.
clean           Clean local caches.
```

#### Service Management:

```
services, ls     List all defined services.
addservice, as   Add a new service.
modifyservice, ms Modify specified service.
removeservice, rs Remove specified service.
refresh-services, refs Refresh all services.
```

#### Software Management:

```
install, in      Install packages.
remove, rm       Remove packages.
verify, ve       Verify integrity of package dependencies.
source-install, si Install source packages and their build
                 dependencies.
install-new-recommends, inr
                 Install newly added packages recommended
                 by installed packages.
```

#### Update Management:

```
update, up      Update installed packages with newer versions.
list-updates, lu List available updates.
patch          Install needed patches.
list-patches, lp List needed patches.
dist-upgrade, dup Perform a distribution upgrade.
patch-check, pchk Check for patches.
```

#### Querying:

```
search, se      Search for packages matching a pattern.
info, if        Show full information for specified packages.
patch-info      Show full information for specified patches.
pattern-info    Show full information for specified patterns.
product-info    Show full information for specified products.
patches, pch    List all available patches.
packages, pa    List all available packages.
patterns, pt    List all available patterns.
products, pd    List all available products.
what-provides, wp List packages providing specified capability.
```

#### Package Locks:

```
addlock, al     Add a package lock.
removelock, rl  Remove a package lock.
locks, ll       List current package locks.
cleanlocks, cl  Remove unused locks.
```

#### Other Commands:

```
versioncmp, vcmp Compare two version strings.
targetos, tos    Print the target operating system ID string.
licenses        Print report about licenses and EULAs of
                 installed packages.
download        Download rpms specified on the commandline to a local directory.
source-download Download source rpms for all installed packages
                 to a local directory.
```

```
Subcommands:
subcommand    Lists available subcommands.
```

Type 'zypper help <command>' to get command-specific help.

## Configuration

La configuration de zypper est effectuée en éditant les fichiers **/etc/zypp/zypp.conf**, **/etc/zypp/zypper.conf** et éventuellement **\$HOME/.zypper.conf** :

L'ordre d'interprétation des configurations est importante :

- Des éventuelles options passées à la commande,
- La configuration dans **\$HOME/.zypper.conf**,
- La configuration dans **/etc/zypp/zypper.conf**,
- La configuration dans **/etc/zypp/zypp.conf**.

### **/etc/zypp/zypp.conf**

```
SUSE12SP1:~ # more /etc/zypp/zypp.conf
## Configuration file for software management
## /etc/zypp/zypp.conf
##
## Boolean values are 0 1 yes no on off true false

[main]

##
## Override the detected architecture
##
## Valid values: i586, i686, x86_64, ppc, ppc64, ia64, s390, s390x, ..
## Default value: Autodetected
```

```
##
## ** CAUTION: Only set if you know what you're doing !
## ** Changing this needs a full refresh (incl. download)
## ** of all repository data.
##
# arch = s390

##
## Path where the caches are kept.
##
## Valid values: A directory
## Default value: /var/cache/zypp
##
# cachedir = /var/cache/zypp

##
## Path where the repo metadata is downloaded and kept.
##
## Valid values: A directory
## Default value: {cachedir}/raw
##
## Changing this needs a full refresh (incl. download) of all repository data
##
--More-- (4%)
```

### **/etc/zypp/zypper.conf**

```
SUSE12SP1:~ # more /etc/zypp/zypper.conf
## Configuration file for Zypper.
##
## location: /etc/zypp/zypper.conf (system-wide)
##          or: $HOME/.zypper.conf (user-specific)
##
```

```
## You can edit this file by hand (try to keep the structure) or by using
## 'zypper conf' command (TODO). If you need user-specific configuration
## and you do not have ~/.zypper.conf yet, use /etc/zypp/zypper.conf
## as template (copy it to ~/.zypper.conf) and adjust to your liking.
##
## The options known also to libzypp will be overridden by zypper.conf, if set.
##
## Boolean values are:
## 0 1 yes no on off true false

## Color values:
## Color values are case insensitive and may be prefixed with
## either Bold, Light or Bright to turn on the terminals
## bold/increased intensity attribute:
## Grey Red Green Blue Brown Cyan Purple/Magenta Black
## White (== LightGrey)
## Yellow (== LightBrown)
## Default (== terminals default color)
## Bold, Light, Bright (== LightDefault, terminals default bold color)

[main]

## Show repository alias instead of name.
##
## Alias is an alternative unique name of repository. Some users prefer
## to define short, handy aliases for their repositories and use them
## when specifying repositories instead of number, name, or URI.
## These users might want to set this option to 'true'.
##
## Other users prefer to keep the aliases and names set by installation,
--More--(18%)
```

## Dépôts



**Important** : Un dépôt est un lieu de stockage de paquets binaires prêts à installer. Un dépôt peut être le DVD d'installation de la distribution, un dossier sur disque dur ou bien des serveurs distants accessibles par Internet.

Les dépôts de paquets sont spécifiés dans un fichier **par dépôt** stocké dans le répertoire **/etc/zypp/repos.d** :

```
SUSE12SP1:~ # ls /etc/zypp/repos.d
SLES12-SP1-12.1-0.repo
SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Debuginfo-Pool.repo
SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Debuginfo-Updates.repo
SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Pool.repo
SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Source-Pool.repo
SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Updates.repo
```

Par exemple :

```
SUSE12SP1:~ # cat /etc/zypp/repos.d/SLES12-SP1-12.1-0.repo
[SLES12-SP1-12.1-0]
name=SLES12-SP1-12.1-0
enabled=1
autorefresh=0
baseurl=cd:///?devices=/dev/disk/by-id/ata-VBOX_CD-ROM_VB2-01700376
path=/
type=yast2
keeppackages=0
```

ou :

```
SUSE12SP1:~ # cat /etc/zypp/repos.d/SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Updates.repo
[SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Updates]
```

```
name=SLES12-SP1-Updates
enabled=1
autorefresh=1
baseurl=https://updates.suse.com/SUSE/Updates/SLE-SERVER/12-SP1/x86_64/update?4Z3im0nkmCfmVfTjzKnS5a1z21vEfrb1Qhx
jo8tVzrZ2-Bz_VQxbeJkQJ8Uo7f7IH1MNmeNGZOLUxhVkgA2iFnLNFd7wwjGUBeBh_c47J_Ngy1uSjUWas-GXe2UdY9wv1yTUy1pQMs5n0HU
type=rpm-md
service=SUSE_Linux_Enterprise_Server_12_SP1_x86_64
```

## Utilisation

Les commandes les plus utilisées de zypper sont :

Commande	Abréviation	Description
install	in	Installer un ou plusieurs paquets.
update	up	Mettre à jour un ou plusieurs paquets. Sans nom(s) de paquet(s), tous les paquets sont mis à jour.
refresh	ref	Rafraîchir le cache des paquets disponibles.
remove	rm	Supprimer un paquet.
what-provides	wp	Visualiser une liste de paquetages qui fournissent le fichier ou caractéristique spécifié.
search -d	se -d	Trouver un paquetage qui a la chaîne recherchée dans sa <i>description</i> .
search	se	Trouver un paquetage qui a la chaîne recherchée dans son <i>nom</i> .
info	if	Obtenir de l'information sur un paquet.
patch		Appliquer les patches nécessaires au système.
verify	ve	Vérifier si les dépendances des paquets installés sont satisfaites.
repos	lr	Lister les dépôts configurés dans votre système.
help		Obtenir de l'aide sur une des commandes ci-dessus. Par exemple <i>zypper help search</i> .

## LAB #1 - Utiliser la commande zypper

Commencez par mettre à jour les dépôts de zypper :

```
SUSE12SP1:~ # zypper refresh
```

```
Repository 'SLES12-SP1-12.1-0' is up to date.
Repository 'SLES12-SP1-Pool' is up to date.
Repository 'SLES12-SP1-Updates' is up to date.
All repositories have been refreshed.
```

Listez les dépôts zypper configurés dans votre système :

```
SUSE12SP1:~ # zypper repos
# | Alias | Name |
Enabled | GPG Check | Refresh
-----+-----+-----
-----+-----+-----
1 | SLES12-SP1-12.1-0 | SLES12-SP1-12.1-0 | Yes
| (r ) Yes | No
2 | SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Debuginfo-Pool | SLES12-SP1-Debuginfo-Pool | No
| ---- | No
3 | SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Debuginfo-Updates | SLES12-SP1-Debuginfo-Updates | No
| ---- | Yes
4 | SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Pool | SLES12-SP1-Pool | Yes
| (r ) Yes | No
5 | SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Source-Pool | SLES12-SP1-Source-Pool | No
| ---- | No
6 | SUSE_Linux_Enterprise_Server_12_SP1_x86_64:SLES12-SP1-Updates | SLES12-SP1-Updates | Yes
| (r ) Yes | Yes
```

Recherchez la chaîne **mc** dans le nom des paquets :

```
SUSE12SP1:~ # zypper search mc
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
```

```
S | Name | Summary |
Type
```



mcstrans srcpackage	SELinux Translation Daemon	
memcached srcpackage	A high-performance, distributed memory object caching system	
memcached package	A high-performance, distributed memory object caching system	
openlmi-bmc package	CMPI provider for BMC management	
openlmi-bmc srcpackage	CMPI provider for BMC management	
sblim-wbemcli package	SBLIM WBEM Command Line Interface	
sblim-wbemcli srcpackage	SBLIM WBEM Command Line Interface	
termcap package	The Termcap Library	
termcap srcpackage	The Termcap Library	
termcap-32bit package	The Termcap Library	
tomcat package	Apache Servlet/JSP/EL Engine, RI for Servlet 3.1/JSP 2.3/EL 3.0 API	
tomcat srcpackage	Apache Servlet/JSP/EL Engine, RI for Servlet 3.1/JSP 2.3/EL 3.0 API	
tomcat-admin-webapps package	The host-manager and manager web applications for Apache Tomcat	
tomcat-docs-webapp package	The docs web application for Apache Tomcat	
tomcat-el-3_0-api package	Expression Language v3.0 API	
tomcat-javadoc package	Javadoc generated documentation for Apache Tomcat	
tomcat-jsp-2_3-api package	Apache Tomcat JSP API implementation classes	

tomcat-lib package	Libraries needed to run the Tomcat Web container	
tomcat-servlet-3_1-api package	Apache Tomcat Servlet API implementation classes	
tomcat-webapps package	ROOT and examples web applications for Apache Tomcat	
i   typelib-1_0-NMClient-1_0 package	Convenience library for clients of NetworkManager -- Introspection bindings	

Recherchez la chaîne **mc** dans la description des paquets :

```
SUSE12SP1:~ # zypper search -d mc
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
```

S	Name	Summary
Type		
-----+-----		
---+-----		
	SUSE-SLE-SERVER-12-SP1-2015-922	Security update for gpg2
	patch	
	SUSE-SLE-SERVER-12-SP1-2016-1004	Security update for the Linux Kernel
	patch	
	SUSE-SLE-SERVER-12-SP1-2016-1103	Recommended update for aaa_base
	patch	
	SUSE-SLE-SERVER-12-SP1-2016-1123	Security update for libarchive
	patch	
	SUSE-SLE-SERVER-12-SP1-2016-1186	Security update for java-1_7_0-openjdk
	patch	
	SUSE-SLE-SERVER-12-SP1-2016-1187	Security update for java-1_8_0-openjdk
	patch	
	SUSE-SLE-SERVER-12-SP1-2016-1246	Security update for the Linux Kernel
	patch	

```
| SUSE-SLE-SERVER-12-SP1-2016-1293 | Security update for tomcat
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1358 | Optional update for gcc6
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1464 | Security update for X Window System client libraries
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1520 | Recommended update for lvm2
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1639 | Security update for jasper
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1654 | Recommended update for pcsc-ccid
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1680 | Security update for libtcnative-1-0
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1683 | Security update for java-1_8_0-openjdk
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1700 | Security update for the Linux Kernel
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1731 | Optional update apache-commons-pool2, apache-commons-dbcp
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1743 | Initial release of libmemcached, memcached, php5-memcached
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1788 | Recommended update for systemd
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1791 | Security update for tomcat
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1795 | Security update for xen
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1931 | Recommended update for hwinfo
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1937 | Security update for tiff
| patch
| SUSE-SLE-SERVER-12-SP1-2016-1940 | Recommended update for shibboleth-sp
| patch
```

```
| SUSE-SLE-SERVER-12-SP1-2016-213 | Recommended update for xorg-x11-server
| patch
| SUSE-SLE-SERVER-12-SP1-2016-379 | Recommended update for wicked
| patch
| SUSE-SLE-SERVER-12-SP1-2016-448 | Security update for tomcat
| patch
| SUSE-SLE-SERVER-12-SP1-2016-556 | Security update for java-1_7_0-openjdk
| patch
| SUSE-SLE-SERVER-12-SP1-2016-599 | Recommended update for release-notes-sles
| patch
| SUSE-SLE-SERVER-12-SP1-2016-600 | Security update for the Linux Kernel
| patch
| SUSE-SLE-SERVER-12-SP1-2016-602 | Recommended update for clamav
| patch
| SUSE-SLE-SERVER-12-SP1-2016-659 | Recommended update for aaa_base
| patch
| SUSE-SLE-SERVER-12-SP1-2016-76  | Security update for wireshark
| patch
| SUSE-SLE-SERVER-12-SP1-2016-761 | Recommended update for lvm2
| patch
| SUSE-SLE-SERVER-12-SP1-2016-929 | Recommended update for mtools
| patch
| SUSE-SLE-SERVER-12-SP1-2017-18  | Recommended update for ipmitool
| patch
| SUSE-SLE-SERVER-12-SP1-2017-238 | Security update for the Linux Kernel
| patch
| SUSE-SLE-SERVER-12-SP1-2017-297 | Security update for xen
| patch
| SUSE-SLE-SERVER-12-SP1-2017-374 | Recommended update for systemd
| patch
| SUSE-SLE-SERVER-12-SP1-2017-625 | Recommended update for tomcat
| patch
| SUSE-SLE-SERVER-12-SP1-2017-740 | Security update for qemu
| patch
```

```
| SUSE-SLE-SERVER-12-SP1-2017-812 | Recommended update for Mesa
| patch
| SUSE-SLE-SERVER-12-SP1-2017-831 | Security update for the Linux Kernel
| patch
| SUSE-SLE-SERVER-12-SP1-2017-848 | Security update for tomcat
| patch
| apache2-mod_jk | Connectors between Apache and Tomcat Servlet Container
| package
| apache2-mod_jk | Connectors between Apache and Tomcat Servlet Container
| srcpackage
i | crash | Crash utility for live systems; netdump, diskdump, LKCD or mcore dumpfiles
| package
| crash | Crash utility for live systems; netdump, diskdump, LKCD or mcore dumpfiles
| srcpackage
i | crash-kmp-default | Crash utility for live systems; netdump, diskdump, LKCD or mcore dumpfiles
| package
| crash-kmp-xen | Crash utility for live systems; netdump, diskdump, LKCD or mcore dumpfiles
| package
i | gpm | Console Mouse Support
| package
| gpm | Console Mouse Support
| srcpackage
i | gpm-32bit | Console Mouse Support
| package
i | ipmitool | Utility for IPMI Control
| package
| ipmitool | Utility for IPMI Control
| srcpackage
| jakarta-commons-pool-tomcat5 | Jakarta Commons Pool Package
| package
i | joe | A Text Editor
| package
| joe | A Text Editor
| srcpackage
```

```
| kdumpid | Utility to extract information from vmcores
| package
| kdumpid | Utility to extract information from vmcores
| srcpackage
i | kernel-default | The Standard Kernel
| package
| kernel-default | The Standard Kernel
| srcpackage
| kernel-default-base | The Standard Kernel - base modules
| package
i | kernel-default-devel | Development files necessary for building kernel modules
| package
i | kernel-devel | Development files needed for building kernel modules
| package
i | kernel-macros | RPM macros for building Kernel Module Packages
| package
| kernel-source | The Linux Kernel Sources
| package
| kernel-source | The Linux Kernel Sources
| srcpackage
| kernel-syms | Kernel Symbol Versions (modversions)
| package
| kernel-syms | Kernel Symbol Versions (modversions)
| srcpackage
| kernel-xen | The Xen Kernel
| package
| kernel-xen | The Xen Kernel
| srcpackage
| kernel-xen-base | The Xen Kernel - base modules
| package
| kernel-xen-devel | Development files necessary for building kernel modules
| package
| libXdmcp | X Display Manager Control Protocol library
| srcpackage
```

```
i | libXdmcp6 | X Display Manager Control Protocol library
| package
| | libXdmcp6-32bit | X Display Manager Control Protocol library
| package
| | libXvMC | X-Video Motion Compensation library
| srcpackage
| | libXvMC1 | X-Video Motion Compensation library
| package
| | libdv | The Quasar DV Codec
| srcpackage
i | libdv4 | The Quasar DV Codec
| package
| | libgme | Collection of video game music file emulators
| srcpackage
i | libgme0 | Collection of video game music file emulators
| package
| | libmemcached | A C/C++ client library and tools for the memcached server
| srcpackage
| | libmemcached | A C/C++ client library and tools for the memcached server
| package
| | libmemcached11 | Libmemcached is a C/C++ client library and tools for the memcached server
| package
| | libmemcachedutil2 | Libmemcached is a C/C++ client library and tools for the memcached server
| package
| | libpcsclite1 | PCSC Smart Card Library
| package
| | libstoragegmt | Storage array management library
| package
| | libstoragegmt | Storage array management library
| srcpackage
| | libstoragegmt1 | Storage array management library
| package
| | libtcnative-1-0 | JNI wrappers for Apache Portable Runtime for Tomcat
| package
```

```
| libtcnative-1-0 | JNI wrappers for Apache Portable Runtime for Tomcat
| srcpackage
| mc | Midnight Commander
| package
| mc | Midnight Commander
| srcpackage
| mc-lang | Languages for package mc
| package
i | mcelog | Log Machine Check Events
| package
| mcelog | Log Machine Check Events
| srcpackage
| mcstrans | SELinux Translation Daemon
| package
| mcstrans | SELinux Translation Daemon
| srcpackage
| memcached | A high-performance, distributed memory object caching system
| srcpackage
| memcached | A high-performance, distributed memory object caching system
| package
i | mtools | Access Files on an MS-DOS File System
| package
| mtools | Access Files on an MS-DOS File System
| srcpackage
| openlmi-bmc | CMPI provider for BMC management
| package
| openlmi-bmc | CMPI provider for BMC management
| srcpackage
i | pcsc-lite | PCSC Smart Cards Library
| package
| pcsc-lite | PCSC Smart Cards Library
| srcpackage
| sblim-wbemcli | SBLIM WBEM Command Line Interface
| package
```

```
| sblim-wbemcli | SBLIM WBEM Command Line Interface
| srcpackage
i | supportutils | Support Troubleshooting Tools
| package
| supportutils | Support Troubleshooting Tools
| srcpackage
| termcap | The Termcap Library
| package
| termcap | The Termcap Library
| srcpackage
| termcap-32bit | The Termcap Library
| package
i | terminfo | A terminal descriptions database
| package
i | terminfo-base | A terminal descriptions database
| package
| tomcat | Apache Servlet/JSP/EL Engine, RI for Servlet 3.1/JSP 2.3/EL 3.0 API
| package
| tomcat | Apache Servlet/JSP/EL Engine, RI for Servlet 3.1/JSP 2.3/EL 3.0 API
| srcpackage
| tomcat-admin-webapps | The host-manager and manager web applications for Apache Tomcat
| package
| tomcat-docs-webapp | The docs web application for Apache Tomcat
| package
| tomcat-el-3_0-api | Expression Language v3.0 API
| package
| tomcat-javadoc | Javadoc generated documentation for Apache Tomcat
| package
| tomcat-jsp-2_3-api | Apache Tomcat JSP API implementation classes
| package
| tomcat-lib | Libraries needed to run the Tomcat Web container
| package
| tomcat-servlet-3_1-api | Apache Tomcat Servlet API implementation classes
| package
```

```

| tomcat-webapps          | ROOT and examples web applications for Apache Tomcat
| package
i | typelib-1_0-NMClient-1_0 | Convenience library for clients of NetworkManager -- Introspection
bindings | package

```

Recherchez tout paquet commençant par **kern** :

```

SUSE12SP1:~ # zypper search kern*
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...

```

S	Name	Summary	Type
i	kernel-default	The Standard Kernel	package
	kernel-default	The Standard Kernel	srcpackage
	kernel-default-base	The Standard Kernel - base modules	package
i	kernel-default-devel	Development files necessary for building kernel modules	package
i	kernel-devel	Development files needed for building kernel modules	package
i	kernel-firmware	Linux kernel firmware files	package
	kernel-firmware	Linux kernel firmware files	srcpackage
i	kernel-macros	RPM macros for building Kernel Module Packages	package
	kernel-source	The Linux Kernel Sources	package
	kernel-source	The Linux Kernel Sources	srcpackage
	kernel-syms	Kernel Symbol Versions (modversions)	package
	kernel-syms	Kernel Symbol Versions (modversions)	srcpackage
	kernel-xen	The Xen Kernel	package
	kernel-xen	The Xen Kernel	srcpackage
	kernel-xen-base	The Xen Kernel - base modules	package
	kernel-xen-devel	Development files necessary for building kernel modules	package
	kernelshark	GUI for trace-cmd	package

Recherchez le paquet qui fournit **mc** :

```
SUSE12SP1:~ # zypper what-provides mc
Command 'what-provides' is replaced by 'search --provides --match-exact'.
See 'help search' for all available options.
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
```

```
S | Name | Summary | Type
---+-----+-----+-----
| mc | Midnight Commander | package
```

Installez le paquet **mc** :

```
SUSE12SP1:~ # zypper install mc
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
Resolving package dependencies...
```

```
The following 3 NEW packages are going to be installed:
 libslang2 mc mc-lang
```

```
The following recommended package was automatically selected:
 mc-lang
```

```
3 new packages to install.
```

```
Overall download size: 1.7 MiB. Already cached: 0 B. After the operation, additional 6.8 MiB will be used.
```

```
Continue? [y/n/? shows all options] (y): y
```

```
Retrieving package libslang2-2.2.4-9.7.x86_64 (1/3), 282.1 KiB
( 1.1 MiB unpacked)
```

```
Retrieving: libslang2-2.2.4-9.7.x86_64.rpm
```

```
.....[done]
```

```
Retrieving package mc-4.8.11-2.110.x86_64 (2/3), 711.9 KiB
( 2.3 MiB unpacked)
```

```
Retrieving: mc-4.8.11-2.110.x86_64.rpm
.....[done]
Retrieving package mc-lang-4.8.11-2.110.noarch (3/3), 759.0 KiB
( 3.4 MiB unpacked)
Retrieving: mc-lang-4.8.11-2.110.noarch.rpm
.....[done (56.0 KiB/s)]
Checking for file conflicts:
.....[done]
(1/3) Installing: libslang2-2.2.4-9.7
.....[done]
(2/3) Installing: mc-4.8.11-2.110
.....[done]
Additional rpm output:
setting /usr/lib/mc/cons.saver to root:root 4755. (wrong permissions 0755)

(3/3) Installing: mc-lang-4.8.11-2.110
.....[done]
```



**Important** - Sous SLES, il existe deux approches pour maintenir le système à jour. La première approche est basée sur des patches tandis que la deuxième est basée sur la mise à jour des paquets. Dans le premier cas, des patches sont téléchargés et appliqués aux versions de paquets stables déjà installées. Dans le deuxième cas, des mises à jour des paquets sont téléchargées et installées, remplaçant ainsi les versions de paquets déjà installées.

Pour visualiser la liste des patches disponibles pour les paquets installés, utilisez la commande suivante :

```
SUSE12SP1:~ # zypper list-patches | more
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
The following software management updates will be installed first:
```



```
-----  
-----  
SLES12-SP1-Updates | SUSE-SLE-SERVER-12-SP1-2015-1001 | security | important | --- | needed | Security  
update for MozillaFi  
refox  
SLES12-SP1-Updates | SUSE-SLE-SERVER-12-SP1-2015-1016 | security | important | --- | needed | Security  
update for bind  
--More--
```

Pour installer les patches, utilisez la commande suivante :

```
SUSE12SP1:~ # zypper patch  
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.  
Loading repository data...  
Reading installed packages...  
Resolving package dependencies...  
  
The following 2 NEW packages are going to be installed:  
  yast2-migration zypper-migration-plugin  
  
The following 8 NEW patches are going to be installed:  
  SUSE-SLE-SERVER-12-SP1-2016-1051 SUSE-SLE-SERVER-12-SP1-2016-1515 SUSE-SLE-SERVER-12-SP1-2016-1602 SUSE-SLE-  
SERVER-12-SP1-2016-269  
  SUSE-SLE-SERVER-12-SP1-2016-532 SUSE-SLE-SERVER-12-SP1-2016-743 SUSE-SLE-SERVER-12-SP1-2016-911 SUSE-SLE-  
SERVER-12-SP1-2017-484  
  
The following 9 packages are going to be upgraded:  
  gnome-packagekit gnome-packagekit-lang libsolv-tools libzypp python-solv yast2-pkg-bindings yast2-registration  
zypper zypper-log  
  
9 packages to upgrade, 2 new.  
Overall download size: 8.9 MiB. Already cached: 0 B. After the operation, additional 600.3 KiB will be used.  
Continue? [y/n/? shows all options] (y): y
```



**Important** - Notez que les patches proposés sont ceux pour le système de gestion de paquets. Ces paquets doivent être patchés avant de pouvoir appliquer les patches aux autres paquets. Veuillez donc à répondre **y** à la question **Continue? [y/n/?] (y)**: de façon à pouvoir poursuivre le cours.

Pour appliquer les autres patches, utilisez de nouveau la commande **zypper patch** :

```
SUSE12SP1:~ # zypper patch
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following 11 NEW packages are going to be installed:
  crash-kmp-default-7.1.5_k3.12.69_60.64.35-10.11 kernel-default-3.12.74-60.64.40.1 kernel-default-
devel-3.12.74-60.64.40.1
  kernel-devel-3.12.74-60.64.40.1 libQt5Network5 libinput-udev libinput10 libts-1_0-0 perl-Expect perl-I0-Stty
perl-I0-Tty

The following 501 NEW patches are going to be installed:
  SUSE-SLE-SERVER-12-SP1-2015-1001 SUSE-SLE-SERVER-12-SP1-2015-1016 SUSE-SLE-SERVER-12-SP1-2015-1022 SUSE-SLE-
SERVER-12-SP1-2015-1027
  SUSE-SLE-SERVER-12-SP1-2015-1028 SUSE-SLE-SERVER-12-SP1-2015-828 SUSE-SLE-SERVER-12-SP1-2015-846 SUSE-SLE-
SERVER-12-SP1-2015-862
  SUSE-SLE-SERVER-12-SP1-2015-863 SUSE-SLE-SERVER-12-SP1-2015-867 SUSE-SLE-SERVER-12-SP1-2015-869 SUSE-SLE-
SERVER-12-SP1-2015-870
  SUSE-SLE-SERVER-12-SP1-2015-922 SUSE-SLE-SERVER-12-SP1-2015-946 SUSE-SLE-SERVER-12-SP1-2015-954 SUSE-SLE-
SERVER-12-SP1-2015-979
  SUSE-SLE-SERVER-12-SP1-2015-985 SUSE-SLE-SERVER-12-SP1-2015-991 SUSE-SLE-SERVER-12-SP1-2015-992 SUSE-SLE-
SERVER-12-SP1-2015-996
  SUSE-SLE-SERVER-12-SP1-2016-10 SUSE-SLE-SERVER-12-SP1-2016-1003 SUSE-SLE-SERVER-12-SP1-2016-1004 SUSE-SLE-
SERVER-12-SP1-2016-1012
```

SUSE-SLE-SERVER-12-SP1-2016-1014 SUSE-SLE-SERVER-12-SP1-2016-1017 SUSE-SLE-SERVER-12-SP1-2016-1021 SUSE-SLE-SERVER-12-SP1-2016-1022  
SUSE-SLE-SERVER-12-SP1-2016-1026 SUSE-SLE-SERVER-12-SP1-2016-1028 SUSE-SLE-SERVER-12-SP1-2016-1029 SUSE-SLE-SERVER-12-SP1-2016-1036  
SUSE-SLE-SERVER-12-SP1-2016-104 SUSE-SLE-SERVER-12-SP1-2016-1048 SUSE-SLE-SERVER-12-SP1-2016-1055 SUSE-SLE-SERVER-12-SP1-2016-1056  
SUSE-SLE-SERVER-12-SP1-2016-1063 SUSE-SLE-SERVER-12-SP1-2016-1083 SUSE-SLE-SERVER-12-SP1-2016-1085 SUSE-SLE-SERVER-12-SP1-2016-1086  
SUSE-SLE-SERVER-12-SP1-2016-1087 SUSE-SLE-SERVER-12-SP1-2016-1090 SUSE-SLE-SERVER-12-SP1-2016-1091 SUSE-SLE-SERVER-12-SP1-2016-1095  
SUSE-SLE-SERVER-12-SP1-2016-1103 SUSE-SLE-SERVER-12-SP1-2016-1109 SUSE-SLE-SERVER-12-SP1-2016-1110 SUSE-SLE-SERVER-12-SP1-2016-1115  
SUSE-SLE-SERVER-12-SP1-2016-1117 SUSE-SLE-SERVER-12-SP1-2016-1123 SUSE-SLE-SERVER-12-SP1-2016-1124 SUSE-SLE-SERVER-12-SP1-2016-1126  
SUSE-SLE-SERVER-12-SP1-2016-113 SUSE-SLE-SERVER-12-SP1-2016-1132 SUSE-SLE-SERVER-12-SP1-2016-1138 SUSE-SLE-SERVER-12-SP1-2016-114  
SUSE-SLE-SERVER-12-SP1-2016-1141 SUSE-SLE-SERVER-12-SP1-2016-1147 SUSE-SLE-SERVER-12-SP1-2016-1149 SUSE-SLE-SERVER-12-SP1-2016-1150  
SUSE-SLE-SERVER-12-SP1-2016-1152 SUSE-SLE-SERVER-12-SP1-2016-1158 SUSE-SLE-SERVER-12-SP1-2016-1159 SUSE-SLE-SERVER-12-SP1-2016-1166  
SUSE-SLE-SERVER-12-SP1-2016-1168 SUSE-SLE-SERVER-12-SP1-2016-117 SUSE-SLE-SERVER-12-SP1-2016-1205 SUSE-SLE-SERVER-12-SP1-2016-1209  
SUSE-SLE-SERVER-12-SP1-2016-121 SUSE-SLE-SERVER-12-SP1-2016-1211 SUSE-SLE-SERVER-12-SP1-2016-1212 SUSE-SLE-SERVER-12-SP1-2016-122  
SUSE-SLE-SERVER-12-SP1-2016-1228 SUSE-SLE-SERVER-12-SP1-2016-124 SUSE-SLE-SERVER-12-SP1-2016-1240 SUSE-SLE-SERVER-12-SP1-2016-1245  
SUSE-SLE-SERVER-12-SP1-2016-1246 SUSE-SLE-SERVER-12-SP1-2016-1247 SUSE-SLE-SERVER-12-SP1-2016-1252 SUSE-SLE-SERVER-12-SP1-2016-1254  
SUSE-SLE-SERVER-12-SP1-2016-1257 SUSE-SLE-SERVER-12-SP1-2016-1258 SUSE-SLE-SERVER-12-SP1-2016-1259 SUSE-SLE-SERVER-12-SP1-2016-1263  
SUSE-SLE-SERVER-12-SP1-2016-1267 SUSE-SLE-SERVER-12-SP1-2016-1277 SUSE-SLE-SERVER-12-SP1-2016-1292 SUSE-SLE-SERVER-12-SP1-2016-1294  
SUSE-SLE-SERVER-12-SP1-2016-1309 SUSE-SLE-SERVER-12-SP1-2016-1310 SUSE-SLE-SERVER-12-SP1-2016-1326 SUSE-SLE-SERVER-12-SP1-2016-1327

SUSE-SLE-SERVER-12-SP1-2016-133 SUSE-SLE-SERVER-12-SP1-2016-1330 SUSE-SLE-SERVER-12-SP1-2016-1331 SUSE-SLE-SERVER-12-SP1-2016-1332  
SUSE-SLE-SERVER-12-SP1-2016-134 SUSE-SLE-SERVER-12-SP1-2016-1342 SUSE-SLE-SERVER-12-SP1-2016-1344 SUSE-SLE-SERVER-12-SP1-2016-1347  
SUSE-SLE-SERVER-12-SP1-2016-1350 SUSE-SLE-SERVER-12-SP1-2016-1352 SUSE-SLE-SERVER-12-SP1-2016-1358 SUSE-SLE-SERVER-12-SP1-2016-136  
SUSE-SLE-SERVER-12-SP1-2016-1362 SUSE-SLE-SERVER-12-SP1-2016-1364 SUSE-SLE-SERVER-12-SP1-2016-1367 SUSE-SLE-SERVER-12-SP1-2016-1370  
SUSE-SLE-SERVER-12-SP1-2016-1374 SUSE-SLE-SERVER-12-SP1-2016-1375 SUSE-SLE-SERVER-12-SP1-2016-1383 SUSE-SLE-SERVER-12-SP1-2016-1388  
SUSE-SLE-SERVER-12-SP1-2016-139 SUSE-SLE-SERVER-12-SP1-2016-1390 SUSE-SLE-SERVER-12-SP1-2016-1393 SUSE-SLE-SERVER-12-SP1-2016-1399  
SUSE-SLE-SERVER-12-SP1-2016-140 SUSE-SLE-SERVER-12-SP1-2016-1406 SUSE-SLE-SERVER-12-SP1-2016-1419 SUSE-SLE-SERVER-12-SP1-2016-1421  
SUSE-SLE-SERVER-12-SP1-2016-1424 SUSE-SLE-SERVER-12-SP1-2016-1430 SUSE-SLE-SERVER-12-SP1-2016-1445 SUSE-SLE-SERVER-12-SP1-2016-1448  
SUSE-SLE-SERVER-12-SP1-2016-1452 SUSE-SLE-SERVER-12-SP1-2016-1454 SUSE-SLE-SERVER-12-SP1-2016-1456 SUSE-SLE-SERVER-12-SP1-2016-1457  
SUSE-SLE-SERVER-12-SP1-2016-1458 SUSE-SLE-SERVER-12-SP1-2016-1461 SUSE-SLE-SERVER-12-SP1-2016-1464 SUSE-SLE-SERVER-12-SP1-2016-1487  
SUSE-SLE-SERVER-12-SP1-2016-1490 SUSE-SLE-SERVER-12-SP1-2016-1492 SUSE-SLE-SERVER-12-SP1-2016-1493 SUSE-SLE-SERVER-12-SP1-2016-1502  
SUSE-SLE-SERVER-12-SP1-2016-1510 SUSE-SLE-SERVER-12-SP1-2016-1519 SUSE-SLE-SERVER-12-SP1-2016-1520 SUSE-SLE-SERVER-12-SP1-2016-1522  
SUSE-SLE-SERVER-12-SP1-2016-155 SUSE-SLE-SERVER-12-SP1-2016-1555 SUSE-SLE-SERVER-12-SP1-2016-1557 SUSE-SLE-SERVER-12-SP1-2016-1558  
SUSE-SLE-SERVER-12-SP1-2016-1560 SUSE-SLE-SERVER-12-SP1-2016-1565 SUSE-SLE-SERVER-12-SP1-2016-157 SUSE-SLE-SERVER-12-SP1-2016-1571  
SUSE-SLE-SERVER-12-SP1-2016-1588 SUSE-SLE-SERVER-12-SP1-2016-1591 SUSE-SLE-SERVER-12-SP1-2016-16 SUSE-SLE-SERVER-12-SP1-2016-1613  
SUSE-SLE-SERVER-12-SP1-2016-1617 SUSE-SLE-SERVER-12-SP1-2016-1621 SUSE-SLE-SERVER-12-SP1-2016-1630 SUSE-SLE-SERVER-12-SP1-2016-1634  
SUSE-SLE-SERVER-12-SP1-2016-1639 SUSE-SLE-SERVER-12-SP1-2016-1644 SUSE-SLE-SERVER-12-SP1-2016-1655 SUSE-SLE-SERVER-12-SP1-2016-1657

SUSE-SLE-SERVER-12-SP1-2016-1663 SUSE-SLE-SERVER-12-SP1-2016-1669 SUSE-SLE-SERVER-12-SP1-2016-1672 SUSE-SLE-SERVER-12-SP1-2016-1681  
SUSE-SLE-SERVER-12-SP1-2016-1690 SUSE-SLE-SERVER-12-SP1-2016-1692 SUSE-SLE-SERVER-12-SP1-2016-1697 SUSE-SLE-SERVER-12-SP1-2016-1698  
SUSE-SLE-SERVER-12-SP1-2016-1700 SUSE-SLE-SERVER-12-SP1-2016-1721 SUSE-SLE-SERVER-12-SP1-2016-1723 SUSE-SLE-SERVER-12-SP1-2016-1734  
SUSE-SLE-SERVER-12-SP1-2016-1735 SUSE-SLE-SERVER-12-SP1-2016-1744 SUSE-SLE-SERVER-12-SP1-2016-1746 SUSE-SLE-SERVER-12-SP1-2016-1749  
SUSE-SLE-SERVER-12-SP1-2016-1754 SUSE-SLE-SERVER-12-SP1-2016-1762 SUSE-SLE-SERVER-12-SP1-2016-1767 SUSE-SLE-SERVER-12-SP1-2016-1771  
SUSE-SLE-SERVER-12-SP1-2016-1774 SUSE-SLE-SERVER-12-SP1-2016-1775 SUSE-SLE-SERVER-12-SP1-2016-1788 SUSE-SLE-SERVER-12-SP1-2016-18  
SUSE-SLE-SERVER-12-SP1-2016-1804 SUSE-SLE-SERVER-12-SP1-2016-1827 SUSE-SLE-SERVER-12-SP1-2016-1831 SUSE-SLE-SERVER-12-SP1-2016-1841  
SUSE-SLE-SERVER-12-SP1-2016-1845 SUSE-SLE-SERVER-12-SP1-2016-1850 SUSE-SLE-SERVER-12-SP1-2016-1853 SUSE-SLE-SERVER-12-SP1-2016-186  
SUSE-SLE-SERVER-12-SP1-2016-1863 SUSE-SLE-SERVER-12-SP1-2016-1868 SUSE-SLE-SERVER-12-SP1-2016-1880 SUSE-SLE-SERVER-12-SP1-2016-1883  
SUSE-SLE-SERVER-12-SP1-2016-1898 SUSE-SLE-SERVER-12-SP1-2016-1908 SUSE-SLE-SERVER-12-SP1-2016-1911 SUSE-SLE-SERVER-12-SP1-2016-1917  
SUSE-SLE-SERVER-12-SP1-2016-1921 SUSE-SLE-SERVER-12-SP1-2016-1922 SUSE-SLE-SERVER-12-SP1-2016-1931 SUSE-SLE-SERVER-12-SP1-2016-1932  
SUSE-SLE-SERVER-12-SP1-2016-1937 SUSE-SLE-SERVER-12-SP1-2016-194 SUSE-SLE-SERVER-12-SP1-2016-197 SUSE-SLE-SERVER-12-SP1-2016-199  
SUSE-SLE-SERVER-12-SP1-2016-201 SUSE-SLE-SERVER-12-SP1-2016-207 SUSE-SLE-SERVER-12-SP1-2016-210 SUSE-SLE-SERVER-12-SP1-2016-213  
SUSE-SLE-SERVER-12-SP1-2016-22 SUSE-SLE-SERVER-12-SP1-2016-225 SUSE-SLE-SERVER-12-SP1-2016-243 SUSE-SLE-SERVER-12-SP1-2016-252  
SUSE-SLE-SERVER-12-SP1-2016-255 SUSE-SLE-SERVER-12-SP1-2016-259 SUSE-SLE-SERVER-12-SP1-2016-266 SUSE-SLE-SERVER-12-SP1-2016-267  
SUSE-SLE-SERVER-12-SP1-2016-270 SUSE-SLE-SERVER-12-SP1-2016-271 SUSE-SLE-SERVER-12-SP1-2016-280 SUSE-SLE-SERVER-12-SP1-2016-286  
SUSE-SLE-SERVER-12-SP1-2016-291 SUSE-SLE-SERVER-12-SP1-2016-294 SUSE-SLE-SERVER-12-SP1-2016-300 SUSE-SLE-SERVER-12-SP1-2016-302

SUSE-SLE-SERVER-12-SP1-2016-304 SUSE-SLE-SERVER-12-SP1-2016-307 SUSE-SLE-SERVER-12-SP1-2016-31 SUSE-SLE-SERVER-12-SP1-2016-311  
SUSE-SLE-SERVER-12-SP1-2016-318 SUSE-SLE-SERVER-12-SP1-2016-329 SUSE-SLE-SERVER-12-SP1-2016-330 SUSE-SLE-SERVER-12-SP1-2016-333  
SUSE-SLE-SERVER-12-SP1-2016-334 SUSE-SLE-SERVER-12-SP1-2016-349 SUSE-SLE-SERVER-12-SP1-2016-353 SUSE-SLE-SERVER-12-SP1-2016-370  
SUSE-SLE-SERVER-12-SP1-2016-371 SUSE-SLE-SERVER-12-SP1-2016-373 SUSE-SLE-SERVER-12-SP1-2016-374 SUSE-SLE-SERVER-12-SP1-2016-375  
SUSE-SLE-SERVER-12-SP1-2016-379 SUSE-SLE-SERVER-12-SP1-2016-38 SUSE-SLE-SERVER-12-SP1-2016-382 SUSE-SLE-SERVER-12-SP1-2016-384  
SUSE-SLE-SERVER-12-SP1-2016-386 SUSE-SLE-SERVER-12-SP1-2016-394 SUSE-SLE-SERVER-12-SP1-2016-398 SUSE-SLE-SERVER-12-SP1-2016-408  
SUSE-SLE-SERVER-12-SP1-2016-413 SUSE-SLE-SERVER-12-SP1-2016-414 SUSE-SLE-SERVER-12-SP1-2016-419 SUSE-SLE-SERVER-12-SP1-2016-44  
SUSE-SLE-SERVER-12-SP1-2016-443 SUSE-SLE-SERVER-12-SP1-2016-444 SUSE-SLE-SERVER-12-SP1-2016-456 SUSE-SLE-SERVER-12-SP1-2016-46  
SUSE-SLE-SERVER-12-SP1-2016-462 SUSE-SLE-SERVER-12-SP1-2016-463 SUSE-SLE-SERVER-12-SP1-2016-464 SUSE-SLE-SERVER-12-SP1-2016-465  
SUSE-SLE-SERVER-12-SP1-2016-466 SUSE-SLE-SERVER-12-SP1-2016-476 SUSE-SLE-SERVER-12-SP1-2016-479 SUSE-SLE-SERVER-12-SP1-2016-487  
SUSE-SLE-SERVER-12-SP1-2016-490 SUSE-SLE-SERVER-12-SP1-2016-491 SUSE-SLE-SERVER-12-SP1-2016-497 SUSE-SLE-SERVER-12-SP1-2016-498  
SUSE-SLE-SERVER-12-SP1-2016-503 SUSE-SLE-SERVER-12-SP1-2016-509 SUSE-SLE-SERVER-12-SP1-2016-510 SUSE-SLE-SERVER-12-SP1-2016-543  
SUSE-SLE-SERVER-12-SP1-2016-565 SUSE-SLE-SERVER-12-SP1-2016-567 SUSE-SLE-SERVER-12-SP1-2016-575 SUSE-SLE-SERVER-12-SP1-2016-578  
SUSE-SLE-SERVER-12-SP1-2016-583 SUSE-SLE-SERVER-12-SP1-2016-586 SUSE-SLE-SERVER-12-SP1-2016-587 SUSE-SLE-SERVER-12-SP1-2016-599  
SUSE-SLE-SERVER-12-SP1-2016-600 SUSE-SLE-SERVER-12-SP1-2016-604 SUSE-SLE-SERVER-12-SP1-2016-61 SUSE-SLE-SERVER-12-SP1-2016-62  
SUSE-SLE-SERVER-12-SP1-2016-624 SUSE-SLE-SERVER-12-SP1-2016-634 SUSE-SLE-SERVER-12-SP1-2016-636 SUSE-SLE-SERVER-12-SP1-2016-643  
SUSE-SLE-SERVER-12-SP1-2016-646 SUSE-SLE-SERVER-12-SP1-2016-659 SUSE-SLE-SERVER-12-SP1-2016-66 SUSE-SLE-SERVER-12-SP1-2016-661

SUSE-SLE-SERVER-12-SP1-2016-663 SUSE-SLE-SERVER-12-SP1-2016-667 SUSE-SLE-SERVER-12-SP1-2016-669 SUSE-SLE-SERVER-12-SP1-2016-67  
SUSE-SLE-SERVER-12-SP1-2016-675 SUSE-SLE-SERVER-12-SP1-2016-683 SUSE-SLE-SERVER-12-SP1-2016-684 SUSE-SLE-SERVER-12-SP1-2016-689  
SUSE-SLE-SERVER-12-SP1-2016-691 SUSE-SLE-SERVER-12-SP1-2016-694 SUSE-SLE-SERVER-12-SP1-2016-697 SUSE-SLE-SERVER-12-SP1-2016-699  
SUSE-SLE-SERVER-12-SP1-2016-704 SUSE-SLE-SERVER-12-SP1-2016-709 SUSE-SLE-SERVER-12-SP1-2016-71 SUSE-SLE-SERVER-12-SP1-2016-713  
SUSE-SLE-SERVER-12-SP1-2016-717 SUSE-SLE-SERVER-12-SP1-2016-722 SUSE-SLE-SERVER-12-SP1-2016-728 SUSE-SLE-SERVER-12-SP1-2016-729  
SUSE-SLE-SERVER-12-SP1-2016-732 SUSE-SLE-SERVER-12-SP1-2016-756 SUSE-SLE-SERVER-12-SP1-2016-761 SUSE-SLE-SERVER-12-SP1-2016-764  
SUSE-SLE-SERVER-12-SP1-2016-781 SUSE-SLE-SERVER-12-SP1-2016-790 SUSE-SLE-SERVER-12-SP1-2016-801 SUSE-SLE-SERVER-12-SP1-2016-803  
SUSE-SLE-SERVER-12-SP1-2016-812 SUSE-SLE-SERVER-12-SP1-2016-818 SUSE-SLE-SERVER-12-SP1-2016-82 SUSE-SLE-SERVER-12-SP1-2016-834  
SUSE-SLE-SERVER-12-SP1-2016-835 SUSE-SLE-SERVER-12-SP1-2016-841 SUSE-SLE-SERVER-12-SP1-2016-845 SUSE-SLE-SERVER-12-SP1-2016-85  
SUSE-SLE-SERVER-12-SP1-2016-863 SUSE-SLE-SERVER-12-SP1-2016-869 SUSE-SLE-SERVER-12-SP1-2016-879 SUSE-SLE-SERVER-12-SP1-2016-880  
SUSE-SLE-SERVER-12-SP1-2016-885 SUSE-SLE-SERVER-12-SP1-2016-890 SUSE-SLE-SERVER-12-SP1-2016-897 SUSE-SLE-SERVER-12-SP1-2016-898  
SUSE-SLE-SERVER-12-SP1-2016-9 SUSE-SLE-SERVER-12-SP1-2016-900 SUSE-SLE-SERVER-12-SP1-2016-905 SUSE-SLE-SERVER-12-SP1-2016-907  
SUSE-SLE-SERVER-12-SP1-2016-909 SUSE-SLE-SERVER-12-SP1-2016-912 SUSE-SLE-SERVER-12-SP1-2016-915 SUSE-SLE-SERVER-12-SP1-2016-916  
SUSE-SLE-SERVER-12-SP1-2016-920 SUSE-SLE-SERVER-12-SP1-2016-922 SUSE-SLE-SERVER-12-SP1-2016-929 SUSE-SLE-SERVER-12-SP1-2016-930  
SUSE-SLE-SERVER-12-SP1-2016-932 SUSE-SLE-SERVER-12-SP1-2016-940 SUSE-SLE-SERVER-12-SP1-2016-941 SUSE-SLE-SERVER-12-SP1-2016-942  
SUSE-SLE-SERVER-12-SP1-2016-943 SUSE-SLE-SERVER-12-SP1-2016-946 SUSE-SLE-SERVER-12-SP1-2016-949 SUSE-SLE-SERVER-12-SP1-2016-96  
SUSE-SLE-SERVER-12-SP1-2016-962 SUSE-SLE-SERVER-12-SP1-2016-967 SUSE-SLE-SERVER-12-SP1-2016-969 SUSE-SLE-SERVER-12-SP1-2016-973

SUSE-SLE-SERVER-12-SP1-2016-98 SUSE-SLE-SERVER-12-SP1-2016-982 SUSE-SLE-SERVER-12-SP1-2016-987 SUSE-SLE-SERVER-12-SP1-2016-992  
SUSE-SLE-SERVER-12-SP1-2016-996 SUSE-SLE-SERVER-12-SP1-2017-101 SUSE-SLE-SERVER-12-SP1-2017-11 SUSE-SLE-SERVER-12-SP1-2017-144  
SUSE-SLE-SERVER-12-SP1-2017-150 SUSE-SLE-SERVER-12-SP1-2017-151 SUSE-SLE-SERVER-12-SP1-2017-156 SUSE-SLE-SERVER-12-SP1-2017-16  
SUSE-SLE-SERVER-12-SP1-2017-177 SUSE-SLE-SERVER-12-SP1-2017-18 SUSE-SLE-SERVER-12-SP1-2017-185 SUSE-SLE-SERVER-12-SP1-2017-196  
SUSE-SLE-SERVER-12-SP1-2017-212 SUSE-SLE-SERVER-12-SP1-2017-217 SUSE-SLE-SERVER-12-SP1-2017-218 SUSE-SLE-SERVER-12-SP1-2017-223  
SUSE-SLE-SERVER-12-SP1-2017-231 SUSE-SLE-SERVER-12-SP1-2017-236 SUSE-SLE-SERVER-12-SP1-2017-238 SUSE-SLE-SERVER-12-SP1-2017-240  
SUSE-SLE-SERVER-12-SP1-2017-241 SUSE-SLE-SERVER-12-SP1-2017-246 SUSE-SLE-SERVER-12-SP1-2017-25 SUSE-SLE-SERVER-12-SP1-2017-260  
SUSE-SLE-SERVER-12-SP1-2017-261 SUSE-SLE-SERVER-12-SP1-2017-263 SUSE-SLE-SERVER-12-SP1-2017-267 SUSE-SLE-SERVER-12-SP1-2017-27  
SUSE-SLE-SERVER-12-SP1-2017-291 SUSE-SLE-SERVER-12-SP1-2017-3 SUSE-SLE-SERVER-12-SP1-2017-309 SUSE-SLE-SERVER-12-SP1-2017-31  
SUSE-SLE-SERVER-12-SP1-2017-312 SUSE-SLE-SERVER-12-SP1-2017-32 SUSE-SLE-SERVER-12-SP1-2017-325 SUSE-SLE-SERVER-12-SP1-2017-326  
SUSE-SLE-SERVER-12-SP1-2017-332 SUSE-SLE-SERVER-12-SP1-2017-333 SUSE-SLE-SERVER-12-SP1-2017-353 SUSE-SLE-SERVER-12-SP1-2017-354  
SUSE-SLE-SERVER-12-SP1-2017-357 SUSE-SLE-SERVER-12-SP1-2017-361 SUSE-SLE-SERVER-12-SP1-2017-374 SUSE-SLE-SERVER-12-SP1-2017-376  
SUSE-SLE-SERVER-12-SP1-2017-392 SUSE-SLE-SERVER-12-SP1-2017-403 SUSE-SLE-SERVER-12-SP1-2017-414 SUSE-SLE-SERVER-12-SP1-2017-439  
SUSE-SLE-SERVER-12-SP1-2017-445 SUSE-SLE-SERVER-12-SP1-2017-446 SUSE-SLE-SERVER-12-SP1-2017-448 SUSE-SLE-SERVER-12-SP1-2017-451  
SUSE-SLE-SERVER-12-SP1-2017-457 SUSE-SLE-SERVER-12-SP1-2017-458 SUSE-SLE-SERVER-12-SP1-2017-478 SUSE-SLE-SERVER-12-SP1-2017-48  
SUSE-SLE-SERVER-12-SP1-2017-480 SUSE-SLE-SERVER-12-SP1-2017-485 SUSE-SLE-SERVER-12-SP1-2017-5 SUSE-SLE-SERVER-12-SP1-2017-512  
SUSE-SLE-SERVER-12-SP1-2017-54 SUSE-SLE-SERVER-12-SP1-2017-542 SUSE-SLE-SERVER-12-SP1-2017-551 SUSE-SLE-SERVER-12-SP1-2017-562

SUSE-SLE-SERVER-12-SP1-2017-571 SUSE-SLE-SERVER-12-SP1-2017-579 SUSE-SLE-SERVER-12-SP1-2017-580 SUSE-SLE-SERVER-12-SP1-2017-582  
SUSE-SLE-SERVER-12-SP1-2017-588 SUSE-SLE-SERVER-12-SP1-2017-589 SUSE-SLE-SERVER-12-SP1-2017-598 SUSE-SLE-SERVER-12-SP1-2017-606  
SUSE-SLE-SERVER-12-SP1-2017-607 SUSE-SLE-SERVER-12-SP1-2017-609 SUSE-SLE-SERVER-12-SP1-2017-610 SUSE-SLE-SERVER-12-SP1-2017-611  
SUSE-SLE-SERVER-12-SP1-2017-62 SUSE-SLE-SERVER-12-SP1-2017-624 SUSE-SLE-SERVER-12-SP1-2017-636 SUSE-SLE-SERVER-12-SP1-2017-639  
SUSE-SLE-SERVER-12-SP1-2017-641 SUSE-SLE-SERVER-12-SP1-2017-643 SUSE-SLE-SERVER-12-SP1-2017-644 SUSE-SLE-SERVER-12-SP1-2017-646  
SUSE-SLE-SERVER-12-SP1-2017-656 SUSE-SLE-SERVER-12-SP1-2017-659 SUSE-SLE-SERVER-12-SP1-2017-668 SUSE-SLE-SERVER-12-SP1-2017-669  
SUSE-SLE-SERVER-12-SP1-2017-693 SUSE-SLE-SERVER-12-SP1-2017-700 SUSE-SLE-SERVER-12-SP1-2017-707 SUSE-SLE-SERVER-12-SP1-2017-71  
SUSE-SLE-SERVER-12-SP1-2017-716 SUSE-SLE-SERVER-12-SP1-2017-720 SUSE-SLE-SERVER-12-SP1-2017-728 SUSE-SLE-SERVER-12-SP1-2017-732  
SUSE-SLE-SERVER-12-SP1-2017-735 SUSE-SLE-SERVER-12-SP1-2017-742 SUSE-SLE-SERVER-12-SP1-2017-743 SUSE-SLE-SERVER-12-SP1-2017-748  
SUSE-SLE-SERVER-12-SP1-2017-750 SUSE-SLE-SERVER-12-SP1-2017-760 SUSE-SLE-SERVER-12-SP1-2017-788 SUSE-SLE-SERVER-12-SP1-2017-789  
SUSE-SLE-SERVER-12-SP1-2017-790 SUSE-SLE-SERVER-12-SP1-2017-793 SUSE-SLE-SERVER-12-SP1-2017-804 SUSE-SLE-SERVER-12-SP1-2017-807  
SUSE-SLE-SERVER-12-SP1-2017-810 SUSE-SLE-SERVER-12-SP1-2017-812 SUSE-SLE-SERVER-12-SP1-2017-816 SUSE-SLE-SERVER-12-SP1-2017-817  
SUSE-SLE-SERVER-12-SP1-2017-831 SUSE-SLE-SERVER-12-SP1-2017-833 SUSE-SLE-SERVER-12-SP1-2017-834 SUSE-SLE-SERVER-12-SP1-2017-835  
SUSE-SLE-SERVER-12-SP1-2017-854 SUSE-SLE-SERVER-12-SP1-2017-856 SUSE-SLE-SERVER-12-SP1-2017-859 SUSE-SLE-SERVER-12-SP1-2017-863  
SUSE-SLE-SERVER-12-SP1-2017-865 SUSE-SLE-SERVER-12-SP1-2017-866 SUSE-SLE-SERVER-12-SP1-2017-869 SUSE-SLE-SERVER-12-SP1-2017-871  
SUSE-SLE-SERVER-12-SP1-2017-872 SUSE-SLE-SERVER-12-SP1-2017-873 SUSE-SLE-SERVER-12-SP1-2017-877 SUSE-SLE-SERVER-12-SP1-2017-888  
SUSE-SLE-SERVER-12-SP1-2017-89 SUSE-SLE-SERVER-12-SP1-2017-895 SUSE-SLE-SERVER-12-SP1-2017-94 SUSE-SLE-SERVER-12-SP1-2017-95

**SUSE-SLE-SERVER-12-SP1-2017-98**

The following package is going to be REMOVED:

ruby2.1-rubygem-suse-connect

The following 636 packages are going to be upgraded:

Mesa Mesa-32bit Mesa-libEGL1 Mesa-libEGL1-32bit Mesa-libGL1 Mesa-libGL1-32bit Mesa-libGLv2-2 Mesa-libglapi0  
Mesa-libglapi0-32bit  
MozillaFirefox MozillaFirefox-branding-SLE MozillaFirefox-translations SUSEConnect SuSEfirewall2 aaa\_base  
aaa\_base-extras acl alsa  
apparmor-docs apparmor-parser apparmor-profiles apparmor-utils at augeas-lenses autofs automake autoyast2  
autoyast2-installation  
bash bash-completion bash-doc bind-libs bind-libs-32bit bind-utils binutils boost-license1\_54\_0  
btrfsmaintenance btrfsprogs bzip2  
ca-certificates-mozilla coreutils coreutils-lang cpio cpio-lang cpp48 cracklib crash cryptsetup cups cups-  
client cups-filters  
cups-filters-cups-browsed cups-filters-foomatic-rip cups-filters-ghostscript cups-libs cups-libs-32bit curl  
dbus-1 dbus-1-x11  
deltarpm desktop-data-SLE device-mapper device-mapper-32bit dhcp dhcp-client dirmngr dmidecode dosfstools  
dracut e2fsprogs eog  
eog-lang expat fdupes findutils fontconfig fontconfig-32bit gcc48 gconf-editor gconf-editor-lang gcr-data gcr-  
lang gcr-prompter gd  
gdb gdk-pixbuf-lang gdk-pixbuf-query-loaders gdm gdm-branding-upstream gdm-lang gdmflexiserver ghostscript  
ghostscript-x11 glibc  
glibc-32bit glibc-devel glibc-i18ndata glibc-locale glibc-locale-32bit gnome-control-center gnome-control-  
center-lang  
gnome-desktop-lang gnome-keyring gnome-keyring-lang gnome-keyring-pam gnome-keyring-pam-32bit gnome-nettool  
gnome-nettool-lang  
gnome-session gnome-session-core gnome-session-default-session gnome-session-lang gnome-settings-daemon gnome-  
settings-daemon-lang  
gnome-shell gnome-shell-browser-plugin gnome-shell-classic gnome-shell-extensions-common gnome-shell-  
extensions-common-lang  
gnome-shell-lang gnome-shell-search-provider-nautilus gnome-version gpg2 gpg2-lang grub2 grub2-i386-pc grub2-  
snapper-plugin



```
libhavege1 libhogweed2
  libical1 libidn-tools libidn11 libidn11-32bit libimobiledevice4 libitm1 libjack0 libjasper1 libkmod2 libksba8
libldap-2_4-2
  libldap-2_4-2-32bit libldb1 libldb1-32bit libltdl7 liblua5_2 libmount1 libmount1-32bit libmozjs-17_0
libnautilus-extension1
  libndr-krb5pac0 libndr-krb5pac0-32bit libndr-nbt0 libndr-nbt0-32bit libndr-standard0 libndr-standard0-32bit
libndr0 libndr0-32bit
  libnetapi0 libnetapi0-32bit libnetpbm11 libnettle4 libnuma1 libopenssl1_0_0 libopenssl1_0_0-32bit libopus0
libp11-kit0 libparted0
  libpcap1 libpci3 libpci3-32bit libpciaccess0 libpciaccess0-32bit libpcre1 libpcre1-32bit libpcre16-0
libpeas-1_0-0 libpeas-gtk-1_0-0
  libplist1 libpng16-16 libpng16-16-32bit libpolkit0 libpoppler-glib8 libpoppler44 libprocps3 libpth20 libpulse-
mainloop-glib0
  libpulse0 libpython2_7-1_0 libpython2_7-1_0-32bit libpython3_4m1_0 libqt4 libqt4-32bit libqt4-sql libqt4-
sql-32bit libqt4-sql-sqlite
  libqt4-x11 libqt4-x11-32bit libquicktime0 libreadline6 libregistry0 libruby2_1-2_1 libsamba-credentials0
libsamba-credentials0-32bit
  libsamba-hostconfig0 libsamba-hostconfig0-32bit libsamba-passdb0 libsamba-passdb0-32bit libsamba-util0
libsamba-util0-32bit
  libsamdb0 libsamdb0-32bit libseccomp2 libsecret-1-0 libsecret-lang libselinux1 libselinux1-32bit libsgutils2-2
libsmartcols1
  lib smbclient-raw0 lib smbclient-raw0-32bit lib smbclient0 lib smbconf0 lib smbconf0-32bit lib smbldap0
lib smbldap0-32bit lib snapper3
  lib sndfile1 lib softokn3 lib softokn3-32bit lib spectre1 lib speechd2 lib sqlite3-0 lib sqlite3-0-32bit lib ssh2-1
lib ssh2-1-32bit
  lib stdc++6 lib stdc++6-32bit lib storage-ruby lib storage6 lib talloc2 lib talloc2-32bit lib tasn1 lib tasn1-6 lib tdb1
lib tdb1-32bit
  lib tevent-util0 lib tevent-util0-32bit lib tevent0 lib tevent0-32bit lib tiff5 lib tiff5-32bit lib tirpc1 lib tool
lib tool-32bit lib tsan0
  libudev1 libudev1-32bit libusbmuxd2 libuuid1 libuuid1-32bit libwbclient0 libwbclient0-32bit libwebp5
libwicked-0-6 libxcb-dri2-0
  libxcb-dri2-0-32bit libxcb-glx0 libxcb-glx0-32bit libxcb-randr0 libxcb-render0 libxcb-render0-32bit libxcb-
shape0 libxcb-shm0
  libxcb-shm0-32bit libxcb-sync1 libxcb-xfixes0 libxcb-xfixes0-32bit libxcb-xkb1 libxcb-xv0 libxcb1 libxcb1-32bit
```

## libxml2-2

```
libxml2-2-32bit libxml2-tools libxslt-tools libxslt1 libz1 libz1-32bit lsof lua lvm2 mailx man man-pages mdadm
mksh mlocate
mozilla-nspr mozilla-nspr-32bit mozilla-nss mozilla-nss-32bit mozilla-nss-certs mozilla-nss-certs-32bit mtools
multipath-tools mutt
nautilus nautilus-lang netcfg netpbm nfs-client nfs-doc nfs-kernel-server nscd ntp numactl open-iscsi
openldap2-client openssl
openssl-32bit openssl-server openssh openssh-helpers openssl os-prober p11-kit p11-kit-tools p7zip pam
pam-32bit pam-doc parted
pciutils pciutils-ids pcsc-lite perl perl-32bit perl-Net-HTTP perl-Net-SSLeay perl-apparmor perl-base perl-
libwww-perl permissions
polkit polkit-default-privs polkit-gnome polkit-gnome-lang poppler-tools postfix ppp procps psmisc psmisc-lang
pulseaudio
pulseaudio-esound-compatible pulseaudio-lang pulseaudio-module-x11 pulseaudio-utils pytalloc pytalloc-32bit python
python-base
python-cffi python-cryptography python-enum34 python-pyasn1 python-xml python3 python3-base python3-speechd
readline-doc
release-notes-sles rpcbind rpm rpm-32bit rpm-python rsync rsyslog ruby-common ruby2.1 ruby2.1-rubygem-gem2rpm
ruby2.1-stdlib samba
samba-32bit samba-client samba-client-32bit samba-libs samba-libs-32bit samba-winbind samba-winbind-32bit
sg3_utils shadow
shared-mime-info sles-admin_en-pdf sles-deployment_en-pdf sles-installquick_en-pdf sles-manuals_en sles-
security_en-pdf
sles-storage_en-pdf sles-tuning_en-pdf snapper snapper-zypp-plugin speech-dispatcher speech-dispatcher-module-
espeak sqlite3 star
strace sudo supportutils suse-build-key suse-module-tools sysconfig sysconfig-netconfig syslinux systemd
systemd-32bit
systemd-bash-completion systemd-presets-branding-SLE systemd-sysvinit tar tar-lang tcpdump tigervnc timezone
typelib-1_0-Gck-1
typelib-1_0-Gcr-3 typelib-1_0-GdkPixbuf-2_0 typelib-1_0-Gdm-1_0 typelib-1_0-GnomeDesktop-3_0 typelib-1_0-
Gtk-3_0
typelib-1_0-Peas-1_0 typelib-1_0-PeasGtk-1_0 typelib-1_0-Polkit-1_0 ucode-intel udev update-alternatives
usbmuxd util-linux
util-linux-lang util-linux-systemd vim vim-data vlan vsftpd w3m wget wicked wicked-service xf86-video-
```

```
modsetting xfsprogs xinit
  xorg-x11-Xvnc xorg-x11-server xorg-x11-server-extra xscreensaver xscreensaver-data yast2 yast2-audit-laf yast2-
bootloader yast2-core
  yast2-dhcp-server yast2-dns-server yast2-firewall yast2-inetd yast2-installation yast2-kdump yast2-mail yast2-
network
  yast2-ntp-client yast2-packager yast2-ruby-bindings yast2-samba-server yast2-schema yast2-services-manager
yast2-storage
  yast2-trans-en_GB yast2-update yast2-users
```

The following 15 patches require a system reboot:

```
SUSE-SLE-SERVER-12-SP1-2015-985 SUSE-SLE-SERVER-12-SP1-2016-1004 SUSE-SLE-SERVER-12-SP1-2016-1012 SUSE-SLE-
SERVER-12-SP1-2016-124
  SUSE-SLE-SERVER-12-SP1-2016-1246 SUSE-SLE-SERVER-12-SP1-2016-1522 SUSE-SLE-SERVER-12-SP1-2016-1700 SUSE-SLE-
SERVER-12-SP1-2016-1762
  SUSE-SLE-SERVER-12-SP1-2016-1845 SUSE-SLE-SERVER-12-SP1-2016-329 SUSE-SLE-SERVER-12-SP1-2016-600 SUSE-SLE-
SERVER-12-SP1-2017-238
  SUSE-SLE-SERVER-12-SP1-2017-267 SUSE-SLE-SERVER-12-SP1-2017-485 SUSE-SLE-SERVER-12-SP1-2017-831
```

636 packages to upgrade, 11 new, 1 to remove.

Overall download size: 486.2 MiB. Already cached: 0 B. After the operation, additional 273.9 MiB will be used.

System reboot required.

Continue? [y/n/? shows all options] (y): n



**Important** - Veuillez à répondre **n** à la question **Continue? [y/n/? shows all options] (y):** de façon à pouvoir poursuivre le cours.

Pour visualiser la disponibilité des mises à jour, utilisez la commande suivante :

```
SUSE12SP1:~ # zypper list-updates
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
```

S	Repository	Name	Current Version	Available Version
	Arch			
v	SLES12-SP1-Updates	Mesa	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-32bit	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libEGL1	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libEGL1-32bit	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libGL1	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libGL1-32bit	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libGLv2-2	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libglapi0	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	Mesa-libglapi0-32bit	10.0.2-90.17	10.0.2-102.7.7
	x86_64			
v	SLES12-SP1-Updates	MozillaFirefox	38.4.0esr-51.1	45.9.0esr-105.1
	x86_64			
v	SLES12-SP1-Updates	MozillaFirefox-branding-SLE	31.0-17.1	45.0-28.2
	x86_64			
v	SLES12-SP1-Updates	MozillaFirefox-translations	38.4.0esr-51.1	45.9.0esr-105.1
	x86_64			
v	SLES12-SP1-Updates	SUSEConnect	0.2.27-1.1	0.3.0-17.8.1
	x86_64			
v	SLES12-SP1-Updates	SuSEfirewall2	3.6.312-1.3	3.6.312-2.3.1
	noarch			
v	SLES12-SP1-Updates	aaa_base	13.2+git20140911.61c1681-9.1	
	13.2+git20140911.61c1681-25.1	x86_64		

```
v | SLES12-SP1-Updates | aaa_base-extras | 13.2+git20140911.61c1681-9.1 |
13.2+git20140911.61c1681-25.1 | x86_64
v | SLES12-SP1-Updates | acl | 2.2.52-3.148 | 2.2.52-6.1
| x86_64
v | SLES12-SP1-Updates | alsa | 1.0.27.2-11.10 | 1.0.27.2-15.1
| x86_64
v | SLES12-SP1-Updates | apparmor-docs | 2.8.2-36.1 | 2.8.2-54.1
| noarch
v | SLES12-SP1-Updates | apparmor-parser | 2.8.2-36.1 | 2.8.2-54.1
| x86_64
v | SLES12-SP1-Updates | apparmor-profiles | 2.8.2-36.1 | 2.8.2-54.1
| noarch
v | SLES12-SP1-Updates | apparmor-utils | 2.8.2-36.1 | 2.8.2-54.1
| noarch
v | SLES12-SP1-Updates | at | 3.1.14-2.1 | 3.1.14-7.3
| x86_64
v | SLES12-SP1-Updates | augeas-lenses | 1.2.0-3.1 | 1.2.0-10.1
| x86_64
v | SLES12-SP1-Updates | autofs | 5.0.9-8.1 | 5.0.9-20.7.1
| x86_64
v | SLES12-SP1-Updates | automake | 1.13.4-4.56 | 1.13.4-6.2
| noarch
v | SLES12-SP1-Updates | autoyast2 | 3.1.101.2-1.1 | 3.1.101.18-15.10
| noarch
v | SLES12-SP1-Updates | autoyast2-installation | 3.1.101.2-1.1 | 3.1.101.18-15.10
| noarch
v | SLES12-SP1-Updates | bash | 4.2-75.2 | 4.2-82.1
| x86_64
v | SLES12-SP1-Updates | bash-completion | 2.1-4.15 | 2.1-10.16.1
| noarch
...
```

Pour appliquer la seule mise à jour de **at**, utilisez la commande suivante :

```
SUSE12SP1:~ # zypper update at
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
Resolving package dependencies...
```

```
The following package is going to be upgraded:
at
```

```
1 package to upgrade.
```

```
Overall download size: 57.2 KiB. Already cached: 0 B. After the operation, additional 96.0 B will be used.
Continue? [y/n/? shows all options] (y): n
```



**Important** - Veuillez à répondre **n** à la question **Continue? [y/n/? shows all options] (y):** de façon à pouvoir poursuivre le cours.

Pour mettre à jour tous les paquets, utilisez la commande suivante :

```
SUSE12SP1:~ # zypper update
Refreshing service 'SUSE_Linux_Enterprise_Server_12_SP1_x86_64'.
Loading repository data...
Reading installed packages...
```

```
The following 11 NEW packages are going to be installed:
```

```
crash-kmp-default-7.1.5_k3.12.69_60.64.35-10.11 kernel-default-3.12.74-60.64.40.1 kernel-default-
devel-3.12.74-60.64.40.1
kernel-devel-3.12.74-60.64.40.1 libQt5Network5 libinput-udev libinput10 libts-1_0-0 perl-Expect perl-I0-Stty
perl-I0-Tty
```

```
The following package is going to be REMOVED:
ruby2.1-rubygem-suse-connect
```

The following 636 packages are going to be upgraded:

```
Mesa Mesa-32bit Mesa-libEGL1 Mesa-libEGL1-32bit Mesa-libGL1 Mesa-libGL1-32bit Mesa-libGLv2-2 Mesa-libglapi0
Mesa-libglapi0-32bit
MozillaFirefox MozillaFirefox-branding-SLE MozillaFirefox-translations SUSEConnect SuSEfirewall2 aaa_base
aaa_base-extras acl alsa
apparmor-docs apparmor-parser apparmor-profiles apparmor-utils at augeas-lenses autofs automake autoyast2
autoyast2-installation
bash bash-completion bash-doc bind-libs bind-libs-32bit bind-utils binutils boost-license1_54_0
btrfsmaintenance btrfsprogs bzip2
ca-certificates-mozilla coreutils coreutils-lang cpio cpio-lang cpp48 cracklib crash cryptsetup cups cups-
client cups-filters
cups-filters-cups-browsed cups-filters-foomatic-rip cups-filters-ghostscript cups-libs cups-libs-32bit curl
dbus-1 dbus-1-x11
deltarpm desktop-data-SLE device-mapper device-mapper-32bit dhcp dhcp-client dirmngr dmidecode dosfstools
dracut e2fsprogs eog
eog-lang expat fdupes findutils fontconfig fontconfig-32bit gcc48 gconf-editor gconf-editor-lang gcr-data gcr-
lang gcr-prompter gd
gdb gdk-pixbuf-lang gdk-pixbuf-query-loaders gdm gdm-branding-upstream gdm-lang gdmflexiserver ghostscript
ghostscript-x11 glibc
glibc-32bit glibc-devel glibc-i18ndata glibc-locale glibc-locale-32bit gnome-control-center gnome-control-
center-lang
gnome-desktop-lang gnome-keyring gnome-keyring-lang gnome-keyring-pam gnome-keyring-pam-32bit gnome-nettool
gnome-nettool-lang
gnome-session gnome-session-core gnome-session-default-session gnome-session-lang gnome-settings-daemon gnome-
settings-daemon-lang
gnome-shell gnome-shell-browser-plugin gnome-shell-classic gnome-shell-extensions-common gnome-shell-
extensions-common-lang
gnome-shell-lang gnome-shell-search-provider-nautilus gnome-version gpg2 gpg2-lang grub2 grub2-i386-pc grub2-
snapper-plugin
gstreamer gstreamer-lang gstreamer-plugins-bad gstreamer-plugins-bad-lang gstreamer-plugins-base gstreamer-
plugins-base-lang
gstreamer-plugins-good gstreamer-plugins-good-lang gtk2-lang gtk2-tools gtk3-data gtk3-lang gtk3-tools guile-
modules-2_0 haveged
hwdm insserv-compat inst-source-utils ipmitool irqbalance iscsiui0 kbd kdump kernel-firmware kernel-macros
```

```
kexec-tools kmod
  kmod-compat kpartx krb5 krb5-32bit libFLAC8 libGLU1 libQt5Core5 libQt5DBus5 libQt5Gui5 libQt5Widgets5
libQt5X11Extras5 libSDL-1_2-0
  libX11-6 libX11-6-32bit libX11-data libX11-xcb1 libX11-xcb1-32bit libXaw3d8 libXaw7 libXfixes3 libXfixes3-32bit
libXfont1 libXi6
  libXi6-32bit libXpm4 libXrandr2 libXrandr2-32bit libXrender1 libXrender1-32bit libXtst6 libXv1 libacl1
libacl1-32bit libapparmor1
  libarchive13 libasan0 libasound2 libasound2-32bit libass5 libatomic1 libaudiofile1 libaugeas0 libavahi-client3
libavahi-client3-32bit libavahi-common3 libavahi-common3-32bit libavahi-glib1 libblkid1 libblkid1-32bit
libbluray1
  libboost_regex1_54_0 libboost_system1_54_0 libboost_thread1_54_0 libbtrfs0 libbz2-1 libbz2-1-32bit libcairo-
gobject2 libcairo2
  libcairo2-32bit libcap2 libcap2-32bit libcom_err2 libcom_err2-32bit libcrack2 libcrack2-32bit libcryptsetup4
libcryptsetup4-32bit
  libcurl4 libcurl4-32bit libdbus-1-3 libdbus-1-3-32bit libdcerpc-binding0 libdcerpc-binding0-32bit libdcerpc0
libdcerpc0-32bit
  libesmtp libexpat1 libexpat1-32bit libext2fs2 libffi4 libffi4-32bit libfltk1 libfreebl3 libfreebl3-32bit
libgbm1 libgbm1-32bit
  libgcl libgcc_s1 libgcc_s1-32bit libgck-1-0 libgck-modules-gnome-keyring libgcr-3-1 libgcrypt20
libgcrypt20-32bit
  libgdk_pixbuf-2_0-0 libgdm1 libgensec0 libgensec0-32bit libgif6-32bit libgme0 libgnome-desktop-3-8 libgnome-
desktop-3_0-common
  libgnomesu libgnomesu-lang libgnomesu0 libgnutls28 libgomp1 libgraphite2-3 libgraphite2-3-32bit libgsm1
libgstallocators-1_0-0
  libgstapp-1_0-0 libgstaudio-1_0-0 libgstbasecamerabinsrc-1_0-0 libgstcodecparsers-1_0-0 libgstegl-1_0-0
libgstfft-1_0-0
  libgstmpegts-1_0-0 libgstpbutils-1_0-0 libgstphotography-1_0-0 libgststreamer-1_0-0 libgststriff-1_0-0
libgststrtp-1_0-0 libgststrtp-1_0-0
  libgstsdp-1_0-0 libgsttag-1_0-0 libgstvideo-1_0-0 libgtk-2_0-0 libgtk-3-0 libgudev-1_0-0 libguile-2_0-22
libhavege1 libhogweed2
  libical1 libidn-tools libidn11 libidn11-32bit libimobiledevice4 libitm1 libjack0 libjasper1 libkmod2 libksba8
libldap-2_4-2
  libldap-2_4-2-32bit libldb1 libldb1-32bit libltdl7 liblua5_2 libmount1 libmount1-32bit libmozjs-17_0
libnautilus-extension1
```

```
libndr-krb5pac0 libndr-krb5pac0-32bit libndr-nbt0 libndr-nbt0-32bit libndr-standard0 libndr-standard0-32bit
libndr0 libndr0-32bit
libnetapi0 libnetapi0-32bit libnetpbm11 libnettle4 libnuma1 libopenssl1_0_0 libopenssl1_0_0-32bit libopus0
libp11-kit0 libparted0
libpcap1 libpci3 libpci3-32bit libpciaccess0 libpciaccess0-32bit libpcre1 libpcre1-32bit libpcre16-0
libpeas-1_0-0 libpeas-gtk-1_0-0
libplist1 libpng16-16 libpng16-16-32bit libpolkit0 libpoppler-glib8 libpoppler44 libprocps3 libpth20 libpulse-
mainloop-glib0
libpulse0 libpython2_7-1_0 libpython2_7-1_0-32bit libpython3_4m1_0 libqt4 libqt4-32bit libqt4-sql libqt4-
sql-32bit libqt4-sql-sqlite
libqt4-x11 libqt4-x11-32bit libquicktime0 libreadline6 libregistry0 libruby2_1-2_1 libsamba-credentials0
libsamba-credentials0-32bit
libsamba-hostconfig0 libsamba-hostconfig0-32bit libsamba-passdb0 libsamba-passdb0-32bit libsamba-util0
libsamba-util0-32bit
libsamdb0 libsamdb0-32bit libseccomp2 libsecret-1-0 libsecret-lang libselinux1 libselinux1-32bit libsgutils2-2
libsmartcols1
libsmbclient-raw0 libsmbclient-raw0-32bit libsmbclient0 libsmbconf0 libsmbconf0-32bit libsmbldap0
libsmbldap0-32bit libsnapper3
libsndfile1 libsoftokn3 libsoftokn3-32bit libspectre1 libspeechd2 libsqlite3-0 libsqlite3-0-32bit libssh2-1
libssh2-1-32bit
libstdc++6 libstdc++6-32bit libstorage-ruby libstorage6 libtalloc2 libtalloc2-32bit libtasn1 libtasn1-6 libtdb1
libtdb1-32bit
libtevent-util0 libtevent-util0-32bit libtevent0 libtevent0-32bit libtiff5 libtiff5-32bit libtirpc1 libtool
libtool-32bit libtsan0
libudev1 libudev1-32bit libusbmuxd2 libuuid1 libuuid1-32bit libwbclient0 libwbclient0-32bit libwebp5
libwicked-0-6 libxcb-dri2-0
libxcb-dri2-0-32bit libxcb-glx0 libxcb-glx0-32bit libxcb-randr0 libxcb-render0 libxcb-render0-32bit libxcb-
shape0 libxcb-shm0
libxcb-shm0-32bit libxcb-sync1 libxcb-xfixes0 libxcb-xfixes0-32bit libxcb-xkb1 libxcb-xv0 libxcb1 libxcb1-32bit
libxml2-2
libxml2-2-32bit libxml2-tools libxslt-tools libxslt1 libz1 libz1-32bit lsof lua lvm2 mailx man man-pages mdadm
mksh mlocate
mozilla-nspr mozilla-nspr-32bit mozilla-nss mozilla-nss-32bit mozilla-nss-certs mozilla-nss-certs-32bit mtools
multipath-tools mutt
```

```
nautilus nautilus-lang netcfg netpbm nfs-client nfs-doc nfs-kernel-server nscd ntp numactl open-iscsi
openldap2-client openssl
openssl-32bit openssl-server openssh openssh-helpers openssl os-prober p11-kit p11-kit-tools p7zip pam
pam-32bit pam-doc parted
pciutils pciutils-ids pcsc-lite perl perl-32bit perl-Net-HTTP perl-Net-SSLeay perl-apparmor perl-base perl-
libwww-perl permissions
polkit polkit-default-privs polkit-gnome polkit-gnome-lang poppler-tools postfix ppp procs psmisc psmisc-lang
pulseaudio
pulseaudio-esound-compatible pulseaudio-lang pulseaudio-module-x11 pulseaudio-utils pytalloc pytalloc-32bit python
python-base
python-cffi python-cryptography python-enum34 python-pyasn1 python-xml python3 python3-base python3-speechd
readline-doc
release-notes-sles rpcbind rpm rpm-32bit rpm-python rsync rsyslog ruby-common ruby2.1 ruby2.1-rubygem-gem2rpm
ruby2.1-stdlib samba
samba-32bit samba-client samba-client-32bit samba-libs samba-libs-32bit samba-winbind samba-winbind-32bit
sg3_utils shadow
shared-mime-info sles-admin_en-pdf sles-deployment_en-pdf sles-installquick_en-pdf sles-manuals_en sles-
security_en-pdf
sles-storage_en-pdf sles-tuning_en-pdf snapper snapper-zypp-plugin speech-dispatcher speech-dispatcher-module-
espeak sqlite3 star
strace sudo supportutils suse-build-key suse-module-tools sysconfig sysconfig-netconfig syslinux systemd
systemd-32bit
systemd-bash-completion systemd-presets-branding-SLE systemd-sysvinit tar tar-lang tcpdump tigervnc timezone
typelib-1_0-Gck-1
typelib-1_0-Gcr-3 typelib-1_0-GdkPixbuf-2_0 typelib-1_0-Gdm-1_0 typelib-1_0-GnomeDesktop-3_0 typelib-1_0-
Gtk-3_0
typelib-1_0-Peas-1_0 typelib-1_0-PeasGtk-1_0 typelib-1_0-Polkit-1_0 ucode-intel udev update-alternatives
usbmuxd util-linux
util-linux-lang util-linux-systemd vim vim-data vlan vsftpd w3m wget wicked wicked-service xf86-video-
modesetting xfsprogs xinit
xorg-x11-Xvnc xorg-x11-server xorg-x11-server-extra xscreensaver xscreensaver-data yast2 yast2-audit-laf yast2-
bootloader yast2-core
yast2-dhcp-server yast2-dns-server yast2-firewall yast2-inetd yast2-installation yast2-kdump yast2-mail yast2-
network
```

```
yast2-ntp-client yast2-packager yast2-ruby-bindings yast2-samba-server yast2-schema yast2-services-manager
yast2-storage
yast2-trans-en_GB yast2-update yast2-users
```

636 packages to upgrade, 11 new, 1 to remove.

Overall download size: 486.2 MiB. Already cached: 0 B. After the operation, additional 273.9 MiB will be used.



**A faire** - Mettez à jour votre système par la méthode de mise à jour des paquets en répondant **y**. Pendant le processus, consultez le manuel de zypper pour vous renseigner sur les autres commandes et options.

## Les Bibliothèques Partagées

### Présentation

#### Introduction

Les bibliothèques partagées sont des fonctions communes à plusieurs programmes différents d'un même **domaine** (son, base de données, vidéo etc.). Les fonctions proposées par une ou plusieurs bibliothèques forment un **API** (*Application Programming Interface*). Sous Linux les bibliothèques se nomment **Shared Objects** et portent le suffixe **.so**.

#### Stockage

Les bibliothèques partagées sont stockées par convention dans des répertoires **lib**, par exemple :

Répertoire	Contenu
/lib	Bibliothèques du système de base

Répertoire	Contenu
/usr/lib	Bibliothèques utilisateurs
/usr/local/lib	Bibliothèques locales
/usr/X11R6/lib	Bibliothèques de l'environnement X
/opt/kde4/lib	Bibliothèques de KDE



**Important** : La bibliothèque la plus importante est **libc**. Sans elle, le système Linux ne peut pas fonctionner.

## ld-linux.so.2

La bibliothèque **ld-linux.so.2** est utilisée par le système pour créer un lien avec une bibliothèque partagée au moment de l'exécution d'un programme et s'appelle le **chargeur de liens**. Ce dernier recherche des bibliothèques partagées dans un ordre précis :

- dans les chemins précisés par la variable système **LD\_LIBRARY\_PATH**,
- dans les chemins précisés dans le contenu compilé du fichier **/etc/ld.so.cache**,
- dans **/lib** et **/usr/lib**.

Il est à noter que le contenu du cache **ld.so.cache** est construit à partir des informations contenus dans le fichier de configuration **/etc/ld.so.conf**.

Afin d'étudier les bibliothèques liées à une application, nous allons d'abord installer l'application **mc**, un explorateur de fichiers en mode console.

## La Commande ldd

Pour déterminer quelles sont les bibliothèques liées à une application, il convient d'utiliser la commande **ldd** :

```
SUSE12SP1:~ # ldd /usr/bin/mc
linux-vdso.so.1 (0x00007fff1b1cd000)
libslang.so.2 => /usr/lib64/libslang.so.2 (0x00007efe9bb68000)
libgpm.so.2 => /usr/lib64/libgpm.so.2 (0x00007efe9b961000)
```

```
libssh2.so.1 => /usr/lib64/libssh2.so.1 (0x00007efe9b735000)
libgmodule-2.0.so.0 => /usr/lib64/libgmodule-2.0.so.0 (0x00007efe9b531000)
libglib-2.0.so.0 => /usr/lib64/libglib-2.0.so.0 (0x00007efe9b22e000)
libpthread.so.0 => /lib64/libpthread.so.0 (0x00007efe9b011000)
libc.so.6 => /lib64/libc.so.6 (0x00007efe9ac69000)
libdl.so.2 => /lib64/libdl.so.2 (0x00007efe9aa65000)
libm.so.6 => /lib64/libm.so.6 (0x00007efe9a764000)
libcrypto.so.1.0.0 => /lib64/libcrypto.so.1.0.0 (0x00007efe9a370000)
libz.so.1 => /lib64/libz.so.1 (0x00007efe9a15a000)
libpcrc.so.1 => /usr/lib64/libpcrc.so.1 (0x00007efe99eeb000)
/lib64/ld-linux-x86-64.so.2 (0x00007efe9bedf000)
```

Afin de comprendre ce qui se passe dans le cas où une bibliothèque est manquante, renommez la bibliothèque **/usr/lib/libslang.so.2** en **/usr/lib/libslang.so.2.old** :

```
SUSE12SP1:~ # mv /usr/lib64/libslang.so.2 /usr/lib64/libslang.so.2.old
```

Exécutez de nouveau la commande ldd. Vous obtiendrez un résultat similaire à celui-ci :

```
SUSE12SP1:~ # ldd /usr/bin/mc
linux-vdso.so.1 (0x00007fffa09c1000)
libslang.so.2 => not found
libgpm.so.2 => /usr/lib64/libgpm.so.2 (0x00007f96b418d000)
libssh2.so.1 => /usr/lib64/libssh2.so.1 (0x00007f96b3f61000)
libgmodule-2.0.so.0 => /usr/lib64/libgmodule-2.0.so.0 (0x00007f96b3d5d000)
libglib-2.0.so.0 => /usr/lib64/libglib-2.0.so.0 (0x00007f96b3a5a000)
libpthread.so.0 => /lib64/libpthread.so.0 (0x00007f96b383d000)
libc.so.6 => /lib64/libc.so.6 (0x00007f96b3495000)
libcrypto.so.1.0.0 => /lib64/libcrypto.so.1.0.0 (0x00007f96b30a1000)
libz.so.1 => /lib64/libz.so.1 (0x00007f96b2e8b000)
libdl.so.2 => /lib64/libdl.so.2 (0x00007f96b2c87000)
libpcrc.so.1 => /usr/lib64/libpcrc.so.1 (0x00007f96b2a18000)
/lib64/ld-linux-x86-64.so.2 (0x00007f96b4394000)
```

Notez la présence de la ligne **libslang.so.2 ⇒ not found**. Compte tenu de la bibliothèque partagée manquante, le programme **mc** ne peut plus être lancé :

```
SUSE12SP1:~ # mc
mc: error while loading shared libraries: libslang.so.2: cannot open shared object file: No such file or directory
```

Renommez la bibliothèque correctement et vérifiez la résolution de l'erreur précédente avec la commande ldd :

```
SUSE12SP1:~ # mv /usr/lib64/libslang.so.2.old /usr/lib64/libslang.so.2
SUSE12SP1:~ # ldd /usr/bin/mc
linux-vdso.so.1 (0x00007ffc3f262000)
libslang.so.2 => /usr/lib64/libslang.so.2 (0x00007f51b70ca000)
libgpm.so.2 => /usr/lib64/libgpm.so.2 (0x00007f51b6ec3000)
libssh2.so.1 => /usr/lib64/libssh2.so.1 (0x00007f51b6c97000)
libgmodule-2.0.so.0 => /usr/lib64/libgmodule-2.0.so.0 (0x00007f51b6a93000)
libglib-2.0.so.0 => /usr/lib64/libglib-2.0.so.0 (0x00007f51b6790000)
libpthread.so.0 => /lib64/libpthread.so.0 (0x00007f51b6573000)
libc.so.6 => /lib64/libc.so.6 (0x00007f51b61cb000)
libdl.so.2 => /lib64/libdl.so.2 (0x00007f51b5fc7000)
libm.so.6 => /lib64/libm.so.6 (0x00007f51b5cc6000)
libcrypto.so.1.0.0 => /lib64/libcrypto.so.1.0.0 (0x00007f51b58d2000)
libz.so.1 => /lib64/libz.so.1 (0x00007f51b56bc000)
libpcre.so.1 => /usr/lib64/libpcre.so.1 (0x00007f51b544d000)
/lib64/ld-linux-x86-64.so.2 (0x00007f51b7441000)
```

## Le fichier **/etc/ld.so.conf**

Le fichier **/etc/ld.so.conf** est utilisé pour configurer le cache **/etc/ld.so.cache** :

```
SUSE12SP1:~ # cat /etc/ld.so.conf
/usr/local/lib64
```

```
/usr/local/lib
include /etc/ld.so.conf.d/*.conf
# /lib64, /lib, /usr/lib64 and /usr/lib gets added
# automatically by ldconfig after parsing this file.
# So, they do not need to be listed.
```

Dans ce cas, le fichier contient des chemins ainsi qu'une directive **include** qui renvoie vers le contenu du répertoire **/etc/ld.so.conf.d/** :

```
SUSE12SP1:~ # ls -l /etc/ld.so.conf.d/
total 0
```

## La Commande ldconfig

La commande **ldconfig** est utilisée pour :

- mettre à jour le cache pour les chemins inclus dans le fichier **/etc/ld.so.conf** ainsi que pour les répertoires **/lib** et **/usr/lib**. L'option **-N** de la commande ldconfig empêche la mise à jour des chemins dans le fichier,
- mettre à jour les liens symboliques sur les bibliothèques. L'option **-X** de la commande ldconfig empêche la mise à jour des liens symboliques.

Les liens symboliques sont utilisés pour gérer les versions de bibliothèques.

La commande ldconfig peut être utilisée avec l'option **-p** pour visualiser le contenu du cache :

```
SUSE12SP1:~ # ldconfig -p | more
1128 libs found in cache `/etc/ld.so.cache'
 libzypp.so.1519 (libc6,x86-64) => /usr/lib64/libzypp.so.1519
 libz.so.1 (libc6,x86-64) => /usr/lib64/libz.so.1
 libz.so.1 (libc6,x86-64) => /lib64/libz.so.1
 libz.so.1 (libc6) => /lib/libz.so.1
 liby2util.so.5 (libc6,x86-64) => /usr/lib64/liby2util.so.5
 liby2.so.4 (libc6,x86-64) => /usr/lib64/liby2.so.4
 libyui.so.7 (libc6,x86-64) => /usr/lib64/libyui.so.7
 libyelp.so.0 (libc6,x86-64) => /usr/lib64/libyelp.so.0
```

```
libyccpvalues.so.6 (libc6,x86-64) => /usr/lib64/libyccpvalues.so.6
libyccp.so.5 (libc6,x86-64) => /usr/lib64/libyccp.so.5
libyam1-0.so.2 (libc6,x86-64) => /usr/lib64/libyam1-0.so.2
libx86emu.so.1 (libc6,x86-64) => /usr/lib64/libx86emu.so.1
libxtables.so.10 (libc6,x86-64) => /usr/lib64/libxtables.so.10
libxslt.so.1 (libc6,x86-64) => /usr/lib64/libxslt.so.1
libxshmfence.so.1 (libc6,x86-64) => /usr/lib64/libxshmfence.so.1
libxml2.so.2 (libc6,x86-64) => /usr/lib64/libxml2.so.2
libxml2.so.2 (libc6) => /usr/lib/libxml2.so.2
libxklavier.so.16 (libc6,x86-64) => /usr/lib64/libxklavier.so.16
libxkbfile.so.1 (libc6,x86-64) => /usr/lib64/libxkbfile.so.1
libxkbcommon.so.0 (libc6,x86-64) => /usr/lib64/libxkbcommon.so.0
libxkbcommon-x11.so.0 (libc6,x86-64) => /usr/lib64/libxkbcommon-x11.so.0
libxcb.so.1 (libc6,x86-64) => /usr/lib64/libxcb.so.1
libxcb.so.1 (libc6) => /usr/lib/libxcb.so.1
libxcb-xv.so.0 (libc6,x86-64) => /usr/lib64/libxcb-xv.so.0
libxcb-xkb.so.1 (libc6,x86-64) => /usr/lib64/libxcb-xkb.so.1
libxcb-xfixes.so.0 (libc6,x86-64) => /usr/lib64/libxcb-xfixes.so.0
libxcb-xfixes.so.0 (libc6) => /usr/lib/libxcb-xfixes.so.0
libxcb-util.so.1 (libc6,x86-64) => /usr/lib64/libxcb-util.so.1
libxcb-sync.so.1 (libc6,x86-64) => /usr/lib64/libxcb-sync.so.1
libxcb-shm.so.0 (libc6,x86-64) => /usr/lib64/libxcb-shm.so.0
libxcb-shm.so.0 (libc6) => /usr/lib/libxcb-shm.so.0
libxcb-shape.so.0 (libc6,x86-64) => /usr/lib64/libxcb-shape.so.0
libxcb-render.so.0 (libc6,x86-64) => /usr/lib64/libxcb-render.so.0
libxcb-render.so.0 (libc6) => /usr/lib/libxcb-render.so.0
--More--
```

Pour ajouter des bibliothèques partagées, il convient de :

- créer un fichier dans le répertoire **/etc/ld.so.conf.d/** et d'y inscrire le ou les chemins vers le lieu de stockage des bibliothèques partagées à ajouter,
- exécuter la commande **ldconfig -v**, où v implique verbose, afin de reconstruire le cache.

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