Slackware

GNU/Linux

Slackware Software Packaging: How and Where To Start

How many of you are aware of the steps in creating Slackware packages

Pritvi Jheengut

13 March 2015

tableofcontent   Introduction   What is a Package?   Preparation For Building   Building The Source Code   Creating The Package

Slackware

GNU/Linux

Outline
Table of Contents

Outline

Prerequisites
The Shell and Coreutils

Shell

- **Some basic shell programming skills**
- GNU Coreutils

Example

GNU Coreutils

- mkdir
- cat
- ls

Prerequisites
The Shell and Coreutils

Shell

- Some basic shell programming skills
- **GNU Coreutils**

Example

GNU Coreutils

- mkdir
- cat
- ls

Prerequisites
The Shell and Coreutils

Shell

- Some basic shell programming skills
- GNU Coreutils

Example

GNU Coreutils

- mkdir
- cat
- ls

Prerequisites
The Shell and Coreutils

Shell

- Some basic shell programming skills
- GNU Coreutils

Example

GNU Coreutils

- **mkdir**
- cat
- ls

Prerequisites
The Shell and Coreutils

Shell

- Some basic shell programming skills
- GNU Coreutils

Example

GNU Coreutils

- mkdir
- cat
- ls

Prerequisites
The Shell and Coreutils

Slackware

GNU/Linux

Shell

- Some basic shell programming skills
- GNU Coreutils

Example

GNU Coreutils

- mkdir
- cat
- ls

Prerequisites
Packaging tools

Slackware

GNU/Linux

Unix

- **tar**
- cp/mv/install
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Slackware
GNU/Linux

Unix

- tar
- **cp/mv/install**
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Unix

- tar
- cp/mv/install
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Unix

- tar
- cp/mv/install
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Slackware

GNU/Linux

Unix

- tar
- cp/mv/install
- wget/curl
- chmod/chown
- **mktemp/mkdir**
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Slackware

GNU/Linux

Unix

- tar
- cp/mv/install
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Slackware

GNU/Linux

Unix

- tar
- cp/mv/install
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Packaging tools

Slackware

GNU/Linux

Unix

- tar
- cp/mv/install
- wget/curl
- chmod/chown
- mktemp/mkdir
- strip
- autotools/make/cmake/python/perl/ruby/
- find/xargs/grep

Prerequisites
Compression Utilities

Slackware

GNU/Linux

Compression Utility

gzip

bzip2

xz/lzma

mime

- ■ **tgz**
- ■ tbz
- ■ txz

Prerequisites
Compression Utilities

Slackware

GNU/Linux

Compression Utility
gzip
bzip2
xz/lzma

mime
■ tgz
■ tbz
■ txz

Prerequisites
Compression Utilities

Compression Utility

gzip

bzip2

xz/lzma

mime

- tgz
- tbz
- txz

Prerequisites
Slackware Basic tools

Slackware

Slackware

- **pkgtool - The Package Manager**
  - http://tukaani.org/pkgtools/ an old forked version
  - installpkg
  - removepkg
  - upgradepkg
  - explodepkg
  - makepkg - The Package Creator/Maker
  - slackbuild scripting

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- `http://tukaani.org/pkgtools/` an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- slackbuild scripting

tableofcontent Introduction What is a Package? Preparation For Building Building The Source Code Creating The Package

Slackware

GNU/Linux

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- http://tukaani.org/pkgtools/ an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- slackbuild scripting

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- http://tukaani.org/pkgtools/ an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- slackbuild scripting

tableofcontent Introduction What is a Package? Preparation For Building Building The Source Code Creating The Package

Slackware

GNU/Linux

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- http://tukaani.org/pkgtools/ an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- slackbuild scripting

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- http://tukaani.org/pkgtools/ an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- slackbuild scripting

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- http://tukaani.org/pkgtools/ an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- slackbuild scripting

Prerequisites
Slackware Basic tools

Slackware

- pkgtool - The Package Manager
- http://tukaani.org/pkgtools/ an old forked version
- installpkg
- removepkg
- upgradepkg
- explodepkg
- makepkg - The Package Creator/Maker
- **slackbuild scripting**

Outline

Definition of a package
A Slacker's goal to world domination

Slackware

GNU/Linux

A Package

Definition: An archive format with/out instructions used for the installation of files on a system

Example

- t7z
- deb
- rpm

mime

- Slackware
- Debian
- Red Hat
- OpenSUSE

Definition of a package
A Slacker's goal to world domination

Slackware
GNU/Linux

A Package

Definition: An archive format with/out instructions used for the installation of files on a system

Example
- t?z
- deb
- rpm

mime
- Slackware
- Debian
- Red Hat
- OpenSUSE

Definition of a package
A Slacker's goal to world domination

A Package

Definition: An archive format with/out instructions used for the installation of files on a system

Example
- t?z
- deb
- rpm

mime
- Slackware
- Debian
- Red Hat
- OpenSUSE

Definition of a package
A Slacker's goal to world domination

A Package

Definition: An archive format with/out instructions used for the installation of files on a system

Example

- t?z
- deb
- rpm

mime

- Slackware
- Debian
- Red Hat
- OpenSUSE

Package Manager
How to install Packages

Slackware

GNU/Linux

Package Manager

A package manager is a collection of software tools that

- install
- upgrade
- configure
- remove
- performs other related jobs

on software packages for a Linux Distribution.

Package Manager
How to install Packages

Slackware

GNU/Linux

Package Manager

A package manager is a collection of software tools that

- install
- upgrade
- configure
- remove
- performs other related jobs

on software packages for a Linux Distribution.

Package Manager
How to install Packages

Package Manager

A package manager is a collection of software tools that

- install
- **upgrade**
- configure
- remove
- performs other related jobs

on software packages for a Linux Distribution.

Package Manager
How to install Packages

Package Manager

A package manager is a collection of software tools that

- install
- upgrade
- **configure**
- remove
- performs other related jobs

on software packages for a Linux Distribution.

Package Manager
How to install Packages

Package Manager

A package manager is a collection of software tools that

- install
- upgrade
- configure
- **remove**
- performs other related jobs

on software packages for a Linux Distribution.

Package Manager
How to install Packages

Package Manager

A package manager is a collection of software tools that

- install
- upgrade
- configure
- remove
- **performs other related jobs**

on software packages for a Linux Distribution.

Package Manager
How to install Packages

Package Manager

A package manager is a collection of software tools that

- install
- upgrade
- configure
- remove
- performs other related jobs

on software packages for a Linux Distribution.

Outline

Slackware

GNU/Linux

1 Introduction

2 What is a Package?

3 Preparation For Building

4 Building The Source Code

5 Creating The Package

6 The End

Prepare The Build Directory
Sanitize The Build Directory

Slackware

GNU/Linux

mktmp
cd /tmp/$"The␣Temporary␣File␣Just␣Created"

mktmp

Create temporary files/directories that are predictable, safe and to avoid possible race conditions.

/tmp

The /tmp directory is assumed to cleaned regularly, sometimes assumed a tmpfs is mount over tmp
The source code is often extracted into /tmp directly.

Prepare The Build Directory
Sanitize The Build Directory

mktmp
cd /tmp/$"The␣Temporary␣File␣Just␣Created"

mktmp

Create temporary files/directories that are predictable, safe and to avoid possible race conditions.

/tmp

The /tmp directory is assumed to cleaned regularly, sometimes assumed a tmpfs is mount over tmp
The source code is often extracted into /tmp directly.

Prepare The Build Directory
Sanitize The Build Directory

Slackware

GNU/Linux

```
mktmp
cd /tmp/$"The␣Temporary␣File␣Just␣Created"
```

mktmp

Create temporary files/directories that are predictable, safe and to avoid possible race conditions.

/tmp

The /tmp directory is assumed to cleaned regularly, sometimes assumed a tmpfs is mount over tmp
The source code is often extracted into /tmp directly.

Prepare The Build Directory
Putting The Source Code in /tmp

Copy The Source Code

Copy the source code archive into the tmp dir

Download The Source Code

Or Download the source code archive into the tmp dir

Prepare The Build Directory
Putting The Source Code in /tmp

Slackware

GNU/Linux

Copy The Source Code

Copy the source code archive into the tmp dir

```
cp ${old path}/${source code archive} .
```

Download The Source Code

Or Download the source code archive into the tmp dir

Prepare The Build Directory
Putting The Source Code in /tmp

Slackware

GNU/Linux

Copy The Source Code

Copy the source code archive into the tmp dir

```
cp ${old path}/${source code archive} .
```

Download The Source Code

Or Download the source code archive into the tmp dir

Prepare The Build Directory
Putting The Source Code in /tmp

Copy The Source Code

Copy the source code archive into the tmp dir

```
cp ${old path}/${source code archive} .
```

Download The Source Code

Or Download the source code archive into the tmp dir

```
wget/curl
protocol://url/${source code archive}
```

Populating The Build Directory

Extracting the source code into The Build Directory

Extracting The Source Code

This step is optional

Extracting The Source Code

Extract files into the 'mktmp'/tmp directory

Populating The Build Directory
Extracting the source code into The Build Directory

Extracting The Source Code

This step is optional

Extracting The Source Code

Extract files into the 'mktmp'/tmp directory

Populating The Build Directory

Extracting the source code into The Build Directory

Extracting The Source Code

This step is optional

```
mkdir build
cd build
```

Extracting The Source Code

Extract files into the 'mktmp'/tmp directory

Populating The Build Directory
Extracting the source code into The Build Directory

Extracting The Source Code

This step is optional

```
mkdir build
cd build
```

Extracting The Source Code

Extract files into the 'mktmp'/tmp directory

Populating The Build Directory

Extracting the source code into The Build Directory

Extracting The Source Code

This step is optional

```
mkdir build
cd build
```

Extracting The Source Code

Extract files into the 'mktmp'/tmp directory

```
tar −xvvf ../"${source_code_archive}"
```

Populating The Build Directory
Extracting the source code into The Build Directory

Slackware

GNU/Linux

Extracting The Source Code
This step is optional

```
mkdir build
cd build
```

Extracting The Source Code
Extract files into the 'mktmp'/tmp directory

```
tar −xvvf ../"${source_code_archive}"
```

$$/tmp \xrightarrow{D} \$PKG \xrightarrow{D} build$$

Outline

Configuration of the source code
Pre-Configuration and Configuration

Slackware

GNU/Linux

pre-configuration

Rarely is pre-configuration performed.

configuration

Most of the times configuration is needed.

Example

autotools

- aclocal
- autoconf
- automake

Example

- ./configure
- cmake
- python setup.py
- gem
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools

- **aclocal**
- autoconf
- automake

Example

- ./configure
- cmake
- python setup.py
- gem
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools
- aclocal
- **autoconf**
- automake

Example
- ./configure
- cmake
- python setup.py
- gem
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools
- aclocal
- autoconf
- **automake**

Example
- ./configure
- cmake
- python setup.py
- gem
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools
- aclocal
- autoconf
- automake

Example
- ■ ./configure
- ■ cmake
- ■ python setup.py
- ■ gem
- ■ qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools
- aclocal
- autoconf
- automake

Example
- ./configure
- cmake
- python setup.py
- gem
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools

- aclocal
- autoconf
- automake

Example

- ./configure
- cmake
- **python setup.py**
- gem
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools
- aclocal
- autoconf
- automake

Example
- ./configure
- cmake
- python setup.py
- **gem**
- qmake

Configuration of the source code
Pre-Configuration and Configuration

pre-configuration
Rarely is pre-configuration performed.

configuration
Most of the times configuration is needed.

Example
autotools

- aclocal
- autoconf
- automake

Example
- ./configure
- cmake
- python setup.py
- gem
- qmake

Building the Source Code

Slackware

GNU/Linux

Building the Source Code

After configuration, the code has to be compiled into machine code.

Example

- make
- perl Makefile.pl
- gem
- python setup.py build

tableofcontent   Introduction   What is a Package?   Preparation For Building   Building The Source Code   Creating The Package

Slackware

Building the Source Code

GNU/Linux

Building the Source Code

After configuration, the code has to be compiled into machine code.

Example

- **make**
- perl Makefile.pl
- gem
- python setup.py build

Building the Source Code

Slackware

GNU/Linux

Building the Source Code

After configuration, the code has to be compiled into machine code.

Example

- make
- **perl Makefile.pl**
- gem
- python setup.py build

Building the Source Code

Slackware

GNU/Linux

Building the Source Code

After configuration, the code has to be compiled into machine code.

Example

- make
- perl Makefile.pl
- **gem**
- python setup.py build

Building the Source Code

Building the Source Code

After configuration, the code has to be compiled into machine code.

Example

- make
- perl Makefile.pl
- gem
- python setup.py build

Building the Source Code
Summary

A Summary

A summary of the job done

$$Pre-Configuration \longrightarrow Configuration \longrightarrow Building$$

Outline

Slackware

GNU/Linux

The Creation of a Package
Populating the package directory

Slackware

GNU/Linux

Installation of Package Files in tmp directory

The package files are installed in a directory using the $PKG = \$TMP/package - \$PRGNAM$ shell path parameter.

The Creation of a Package
Populating the package directory

Slackware

GNU/Linux

Installation of Package Files in tmp directory

The package files are installed in a directory using the $PKG = \$TMP/package - \$PRGNAM$ shell path parameter.

```
make install DESTDIR=$PKG
python setup.py install --root=$PKG
gem install --install-dir $PKG/$DESTDIR
```

The Creation of a Package

Populating the package directory

Slackware

GNU/Linux

Installation of Package Files in tmp directory

The package files are installed in a directory using the $PKG = \$TMP/package - \$PRGNAM$ shell path parameter.

```
make install DESTDIR=$PKG
python setup.py install --root=$PKG
gem install --install-dir $PKG/$DESTDIR
```

$Pre - Configuration \longrightarrow Configuration \longrightarrow Building \longrightarrow Install$

The Creation of a Package
Performing the usual Slackware Business

stripping of binaries

After installation of object files/binaries, they need to be stripped off of unnecessary symbols.

The Creation of a Package
Performing the usual Slackware Business

Slackware

GNU/Linux

stripping of binaries

After installation of object files/binaries, they need to be stripped off of unnecessary symbols.

```
find $PKG −print0 | xargs −0 file \
 | grep −e "executable" −e "shared object" \
 | grep ELF | cut −f 1 −d : \
 | xargs strip −−strip−unneeded \
2> /dev/null || true
```

The Creation of a Package
Performing the usual Slackware Business

Slackware

GNU/Linux

strip and the rest

stripping is one of a few more steps in making a more acceptable package, others include compressing the man and info pages, removing excess data and adding documentation
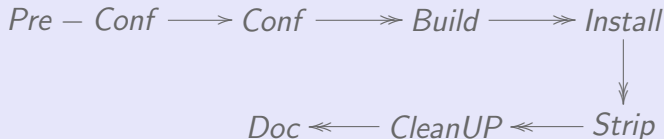
The Creation of a Package
Performing the usual Slackware Business

strip and the rest

stripping is one of a few more steps in making a more acceptable package, others include compressing the man and info pages, removing excess data and adding documentation

$$Pre - Conf \longrightarrow Conf \longrightarrow Build \longrightarrow Install$$

$$Doc \ll\!\!- CleanUP \ll\!\!- Strip$$

The Creation of a Package

install directory

$PKG/install directory

An extra install directory exist in all Slackware Packages. This folder normally contains two files.

- **slack-desc : This contains a summary and full description of the package.**
- doinst.sh : contains instructions for the post installation stage, most of the time linking of files.

The Creation of a Package

install directory

$PKG/install directory

An extra install directory exist in all Slackware Packages. This folder normally contains two files.

- slack-desc : This contains a summary and full description of the package.

- doinst.sh : contains instructions for the post installation stage, most of the time linking of files.
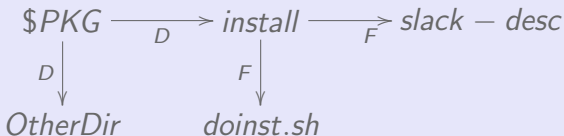
The Creation of a Package
install directory

$PKG/install directory

An extra install directory exist in all Slackware Packages. This folder normally contains two files.

- slack-desc : This contains a summary and full description of the package.

- doinst.sh : contains instructions for the post installation stage, most of the time linking of files.

The Creation of a Package

install directory

$PKG/install directory

An extra install directory exist in all Slackware Packages. This folder normally contains two files.

- slack-desc : This contains a summary and full description of the package.

- doinst.sh : contains instructions for the post installation stage, most of the time linking of files.

$$\begin{CD} \$PKG @>D>> install @>F>> slack-desc \\ @VDVV @VFVV \\ OtherDir @. doinst.sh \end{CD}$$

The Creation of a Package

install directory

$PKG/install directory

Copy the slack-desc and a custom doinst.sh if necessary into ./install

The Creation of a Package

install directory

$PKG/install directory

Copy the slack-desc and a custom doinst.sh if necessary into
./install

```
mkdir −p $PKG/install

cat $CWD/slack−desc > \
$PKG/install/slack−desc

cat $CWD/doinst.sh > \
$PKG/install/doinst.sh
```

The Creation of a Package
Using makepkg

Makepkg

makepkg creates a Slackware compatible package. The package is constructed using the contents of the current directory and all sub directories.

The Creation of a Package
Using makepkg

Slackware

GNU/Linux

Makepkg

makepkg creates a Slackware compatible package. The package is constructed using the contents of the current directory and all sub directories.

```
cd $PKG
makepkg $PRGNAM.tgz
```

The Creation of a Package

makepkg options

Example

makepkg options

- option -l :: add any symbolic links found to the install script (doinst.sh) and delete them.
- option -c :: makepkg will reset all directory permissions to 755 and ownership to root:root

The Creation of a Package

makepkg options

Example

makepkg options

- option -l :: add any symbolic links found to the install script (doinst.sh) and delete them.

- option -c :: makepkg will reset all directory permissions to 755 and ownership to root:root

The Creation of a Package
makepkg options

Makepkg

with makepkg full options

```
/sbin/makepkg \
-l y \
-c n \
/tmp/$PRGNAM-$VERSION-$ARCH-$BUILD$TAG.tgz
```

Package

This is it, your package is ready and waiting for you in /tmp.

The Creation of a Package
makepkg options

Makepkg

with makepkg full options

```
/ s b i n / makepkg \
−l  y \
−c  n \
/ tmp /$PRGNAM−$VERSION−$ARCH−$BUILD$TAG . t g z
```

Package

This is it, your package is ready and waiting for you in /tmp.

Slackbuilds
Scripting

Slackbuilds

Want to Automate your package building, then the only sane way is maintaining a script that we commonly call slackbuild script. All the steps above are entered into a script and tada, its done.

Slackbuilds
Scripting

Slackware

GNU/Linux

Slackbuilds

Want to Automate your package building, then the only sane way is maintaining a script that we commonly call slackbuild script. All the steps above are entered into a script and tada, its done.

```
#!/bin/bash
PKG=/tmp/package-$PRGNAM
rm -rf $PKG
mkdir -p $TMP $PKG
cd /tmp
rm -rf $PRGNAM-$VERSION
```

Slackbuilds
Scripting - continued

```
tar xvf $CWD/$PRGNAM-$VERSION.tar.gz
cd $PRGNAM-$VERSION
chown -R root:root .
./configure
make
make install DESTDIR=$PKG
find ... | xargs strip ...
mkdir -p $PKG/install
cat $CWD/slack-desc > $PKG/install/slack-des
cat $CWD/doinst.sh > $PKG/install/doinst.sh
cd $PKG
/sbin/makepkg /tmp/$PRGNAM.tgz
```

Slackbuilds

slackbuilds.org

slackbuilds.org

Templates can be found at http://slackbuilds.org/templates

Outline

Goal
A Slacker's goal to world domination

Goal

■ **slack the hard way**

■ sip some beer

■ Take over the world

■ Relax...

Goal
A Slacker's goal to world domination

Slackware
GNU/Linux

Goal

- slack the hard way
- sip some beer
- Take over the world
- Relax...

Goal

A Slacker's goal to world domination

Goal

- slack the hard way
- sip some beer
- Take over the world
- Relax...

Goal

A Slacker's goal to world domination

Goal

- slack the hard way
- sip some beer
- Take over the world
- Relax...

Resources
If you want to improve this style

📄 LaTeX Beamer
`http://latex-beamer.sourceforge.net/`

📄 KDE Presentations
`http://www.kde.org/kdeslides/`

📄 My Prezz at Github
`https://github.com/Bluetailedgecko/`
`Slackware-Software-Packaging-Presentation`

Slackware

GNU/Linux

Questions ?

Pritvi Jheengut

z.coldplayer@gmail.com