

apt-get install leiningen

Reviving the Debian Clojure Ecosystem

Elana Hashman

The Debian Project

ClojureSYNC – New Orleans, LA

 @ehashdn

Outline

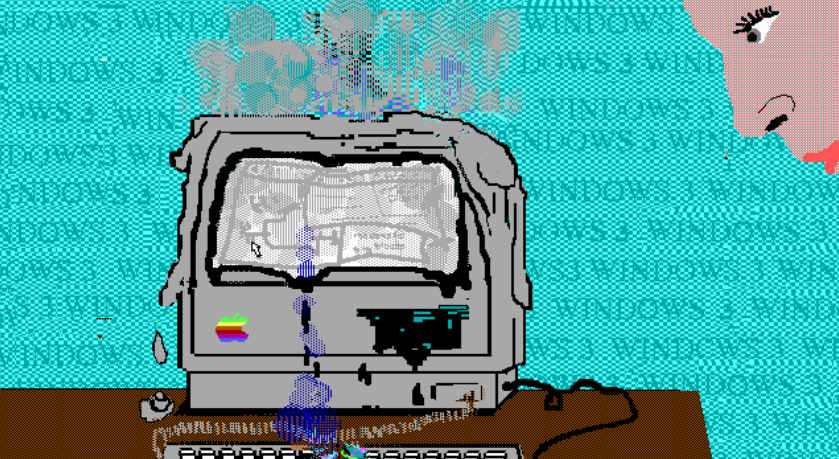
- What is Debian?
- Why do Linux distributions package software?
- What are the benefits of downstream packagers?
- Building Clojure projects... without leiningen's help
- Conclusion, Q&A

What is Debian?



debian

The '90s



Courtesy of Integrated Micro Systems

US Robotics 9600 (918) 747-3560

Summary: small poll for my new operating system

Date: 25 Aug 91 20:57:08 GMT

Hello everybody out there using minix -

I'm doing a (free) operating system (**just a hobby, won't be big and professional like gnu**) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) among other things).

I've currently ported bash(1.08) and gcc(1.40), and things seem to work. This implies that I'll get something practical within a few months, and I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them :-)

Linus (torvalds@kruuna.helsinki.fi)

PS. Yes - it's free of any minix code, and it has a multi-threaded fs. It is NOT protable (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-).

Where do you even get software these days?!



Many of the programs on this disc are
shareware, and require sepearate payment
to the author for continued use.

GIFs Galore
CDROM

August 1992
ISO-9660 Format

COMPACT
disc
DATA STORAGE
CDRM1017600

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Walnut Creek, CA 94596
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Thousands of full color GIF images, with viewers for MSDOS, Mac, Amiga, Unix,
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ri ST, etc



MITS - Tätä boksia KISSA vartioi! (Beware of the CAT!)

+358-0-557839,557452 (HST/DS), after May 1990: +358-0-458-2066 HST
458-2077 HST/DS



PHASE IV PHOTO
MODEM: (201)727-7514

CATS1.GIF



nds of fu
ri ST, etc

MITS - Tätä boksia KISSA vartioi! (Beware of the CAT!)

+358-0-557839,557452 (HST/DS), after May 1990: +358-0-458-2066 HST
458-2077 HST/DS

Linux + GNU
= GNU/Linux Distribution



The First Linux Distributions



Debian GNU/Linux

A Brief History of Debian

Appendix A - The Debian Manifesto

Written by Ian A. Murdock, Revised 01/06/94

A.1 What is Debian Linux?

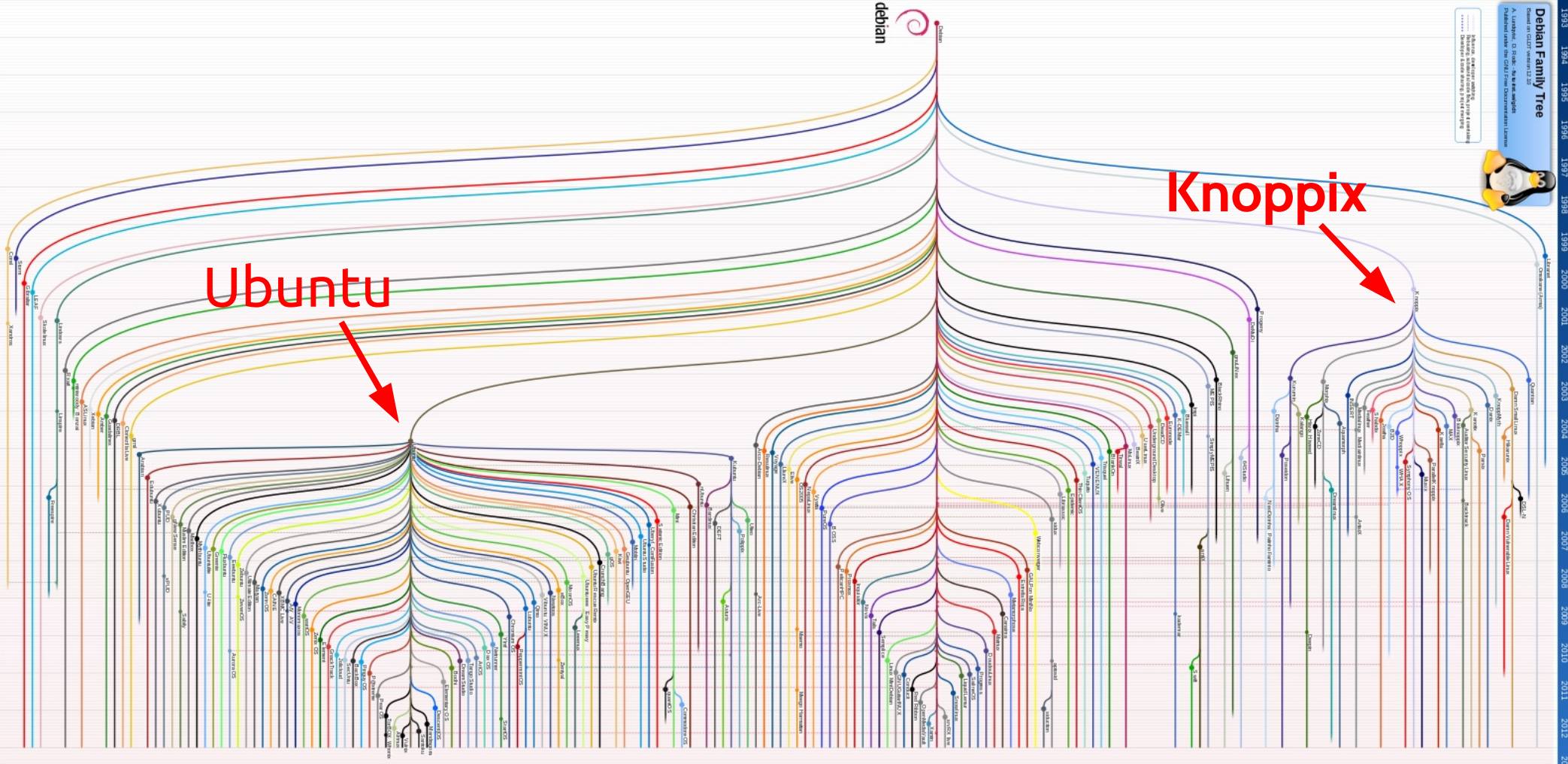
Debian Linux is a brand-new kind of Linux distribution. Rather than being developed by one isolated individual or group, as other distributions of Linux have been developed in the past, Debian is being developed openly in the spirit of Linux and GNU. The primary purpose of the Debian project is to finally create a distribution that lives up to the Linux name. Debian is being carefully and conscientiously put together and will be maintained and supported with similar care.

It is also an attempt to create a non-commercial distribution that will be able to effectively compete in the commercial market. It will eventually be distributed by The Free Software Foundation on CD-ROM, and The Debian Linux Association will offer the distribution on floppy disk and tape along with printed manuals, technical support and other end-user essentials. All of the above will be available at little more than cost, and the excess will be put toward further development of free software for all users. Such distribution is essential to the success of the Linux operating system in the commercial market, and it must be done by organizations in a position to successfully advance and advocate free software without the pressure of profits or returns.










A.2 Why is Debian being constructed?

100% Free Software

100% Volunteer-built



You might be using it on Docker Hub

 mysql official		5.2K STARS	10M+ PULLS	> DETAILS	
 registry official	base for 7 out of 11 top images		1.7K STARS	10M+ PULLS	> DETAILS
 mongo official		3.8K STARS	10M+ PULLS	> DETAILS	
 postgres official		4.2K STARS	10M+ PULLS	> DETAILS	
 node official		4.7K STARS	10M+ PULLS	> DETAILS	

Why would users want OS packages?

Why not use the upstream sources directly?

Building software is hard.

TLDR pages

Simplified and community-driven man pages



Star

16,388



Follow

951 followers

chat

on gitter

The TLDR pages are a community effort to simplify the beloved [man pages](#) with practical examples.

```
> tldr tar
```

```
tar
```

```
Archiving utility.
```

```
Optional compression with gzip / bzip.
```

```
- Create an archive from files:
```

```
tar cf target.tar file1 file2 file3
```

```
- Create a gzipped archive:
```

```
tar czf target.tar.gz file1 file2 file3
```

```
- Extract an archive in a target folder:
```

```
tar xf source.tar -C folder
```


Security is HARD.

Software installations should work together.

``apt-get install`` is easier!

Packaging software doesn't just help end users:
it helps the development community, too!

What happened to Clojure in Debian?

“Elana, we need more women in Debian.
Why don't you pick up packaging leiningen?”

- Tom Marble, Clojure with no shame

“Tom, I barely even know how to put a Debian package together. Besides, who's stupid enough to commit hundreds of unpaid hours to this?”

“Tom, I barely even know how to put a Debian package together. Besides, who's stupid enough to commit hundreds of unpaid hours to this?”

Narrator: SHE WAS

Leiningen was the missing center of the Debian Clojure ecosystem. For some reason, it went for four years without a maintainer.

Reviving the Leiningen
package was ... a journey

Step 1: Build a dependency tree.

```
[cheshire "5.6.3"]
  [com.fasterxml.jackson.core/jackson-core "2.7.5"]
  [com.fasterxml.jackson.dataformat/jackson-dataformat-cbor "2.7.5"]
  [com.fasterxml.jackson.dataformat/jackson-dataformat-smile "2.7.5"]
  [tigris "0.1.1"]
[classlojure "0.6.6"]
  [useful "0.8.3-alpha8"]
  [org.clojure/tools.macro "0.1.1"]
[clj-http "2.0.1"]
  [commons-codec "1.10" :exclusions [[org.clojure/clojure]]]
  [org.apache.httpcomponents/httpclient "4.5" :exclusions
[[org.clojure/clojure]]]
  [org.apache.httpcomponents/httpcore "4.4.1" :exclusions
[[org.clojure/clojure]]]
  [org.apache.httpcomponents/httpmime "4.5" :exclusions
[[org.clojure/clojure]]]
  [potemkin "0.4.1" :exclusions [[org.clojure/clojure]]]
  [clj-tuple "0.2.2"]
  [riddley "0.1.10"]
[pedantic "0.2.0"]
[net.cgrand/parsley "0.9.3" :exclusions [[org.clojure/clojure]]]
  [net.cgrand/regex "1.1.0"]
[org.clojure/tools.nrepl "0.2.12"]
[reply "0.3.7" :exclusions [[ring/ring-core] [org.thnetos/cd-client]]]
  [clj-stacktrace "0.2.7"]
  [com.cemerick/drawbridge "0.0.6" :exclusions
[[org.clojure/tools.nrepl]]]
  [jline "2.12.1"]
  [net.cgrand/sjacket "0.1.1" :exclusions [[org.clojure/clojure]]]
  [org.clojure/tools.cli "0.3.1"]
  [trptcolin/versioneer "0.1.1"]
[stencil "0.5.0" :exclusions [[org.clojure/core.cache]]]
  [quoin "0.1.2"]
  [scout "0.1.0"]
```


**Step 2: Reconcile the dep
versions against Debian.**

Step 3: Send emails.

Step 4: (*deus ex machina*)

Upstream developer rescues you
from 7+ missing dependencies.

Debian benefit #1:
improved upstream code

Debian benefit #2:
improved upstream security

UPGRADE POMEGRANATE IF YOU USE VERSION

⚠ [0.0.12, 0.4.0-alpha1) ⚠

Step 5: Package the dependencies.

What does a Debian package look like?

- A tarball of the original source code
- Debian paperwork
 - The *control* file
 - The *copyright* file
 - The *rules* file
 - The *changelog*
 - *Patches* to apply to the original source

Source: scout-clojure

Section: java

Maintainer: Debian Clojure Maintainers

[<clojure-team@lists.debian.org>](mailto:clojure-team@lists.debian.org)

Uploaders:

Eugenio Cano-Manuel Mendoza [<eugeniocanom@gmail.com>](mailto:eugeniocanom@gmail.com)

Build-Depends:

[debhelper](#) (>= 10) ,

[maven-repo-helper](#) (>= 1.7) ,

[default-jdk](#) ,

[javahelper](#) (>= 0.43) ,

[libclojure-java](#) (>= 1.8)

Standards-Version: 4.1.1

Vcs-Git: <https://anonscm.debian.org/git/pkg-clojure/scout.git>

Homepage: <https://github.com/davidsantiago/scout>

Package: libscout-clojure

Architecture: all

Depends: [\\${java:Depends}](#) , [\\${misc:Depends}](#)

Description: Clojure library to parse strings

Format: 1.0

Upstream-Name: scout

Source: <https://github.com/davidsantiago/scout>

Files: *

Copyright: Copyright (C) 2012 David Santiago

[<david.santiago@gmail.com>](mailto:david.santiago@gmail.com)

License: EPL-1

Files: [debian/](#)*

Copyright: Copyright (C) 2013 Eugenio Cano-Manuel Mendoza

[<eugeniocanom@gmail.com>](mailto:eugeniocanom@gmail.com)

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License: EPL-1

Eclipse Public License - v 1.0

.

THE ACCOMPANYING PROGRAM IS PROVIDED UNDER THE TERMS OF THIS ECLIPSE PUBLIC LICENSE ("AGREEMENT"). ANY USE, REPRODUCTION OR DISTRIBUTION OF THE PROGRAM CONSTITUTES RECIPIENT'S ACCEPTANCE OF THIS AGREEMENT.

```
#!/usr/bin/make -f
```

```
PRODUCED_JAR=scout.jar
```

```
%:
```

```
dh $@ --with javahelper,maven_repo_helper
```

```
override_jh_build:
```

```
jar cf $(PRODUCED_JAR) -C src .
```

```
override_jh_clean:
```

```
jh_clean
```

```
rm -f $(CURDIR) / $(PRODUCED_JAR)
```

scout-clojure (0.1.1-1) unstable; urgency=low

- * Make debian/* license EPL-1 compatible
- * Use maven-repo-helper during the build
- * Removed unused javabuild file
- * Include maven metadata in scout.jar

- - **Eugenio Cano-Manuel Mendoza** <eugeniocanom@gmail.com>

Thu, 29 Aug 2013 20:09:51 -0400

scout-clojure (0.1.0-1) unstable; urgency=low

- * Initial release. (**Closes: #709628**)

- - **Eugenio Cano-Manuel Mendoza** <eugeniocanom@gmail.com>

Mon, 29 Apr 2013 18:20:53 +0200

From: Elana Hashman <ehashman@debian.org>

Date: Thu, 21 Dec 2017 18:09:35 +0000

Subject: Build in offline mode with local repo

project.clj | 4 +++-

1 file changed, 3 insertions(+), 1 deletion(-)

diff --git a/project.clj b/project.clj

index fc32d11..606d727 100644

--- a/project.clj

+++ b/project.clj

@@ -36,4 +36,6 @@

 :offline (comp (partial not-any? identity)
 (juxt :online :disabled))}

 :source-paths ["leiningen-core/src" "src"]

- :eval-in :leiningen)

+ :eval-in :leiningen

+ :offline? true

+ :local-repo "debian/maven-repo")

Hardest part = filling out the *rules* file

Rules file: Clojure build without a build framework

```
PRODUCED_JAR=scout.jar
```

```
%:
```

```
dh $@ --with javahelper,maven_repo_helper
```

```
override_jh_build:
```

```
jar cf $(PRODUCED_JAR) -C src .
```

```
override_jh_clean:
```

```
jh_clean
```

```
rm -f $(CURDIR) / $(PRODUCED_JAR)
```

```
$ jar tvf /usr/share/java/gettext.jar
```

```
  0 Mon Apr 28 15:42:26 META-INF/  
 68 Mon Apr 28 15:42:26 META-INF/MANIFEST.MF  
5413 Mon Apr 28 15:42:24 gnu/gettext/DumpResource.class  
 639 Mon Apr 28 15:42:26 gnu/gettext/GetURL$1.class  
1624 Mon Apr 28 15:42:26 gnu/gettext/GetURL.class
```

```
$ jar xvf /usr/share/java/gettext.jar
```

```
$ cat META-INF/MANIFEST.MF
```

```
Manifest-Version: 1.0
```

```
Created-By: 1.7.0_51 (Oracle Corporation)
```

```
...
```

```
Main-Class: com.example.MyClassName
```

```
Class-Path: . pkg1.jar path/to/pkg2.jar
```


JAR Built with Debian

0 Feb 10 22:23:22 META-INF/

69 Feb 10 22:23:22 META-INF/MANIFEST.MF

0 Aug 19 02:55:02 scout/

6514 Aug 19 02:55:02 scout/core.clj

JAR Built with Leiningen

122	Feb	10	META-INF/MANIFEST.MF
1996	Feb	10	META-INF/maven/scout/scout/pom.xml
433	Feb	10	META-INF/leiningen/scout/scout/project.clj
3218	Feb	10	META-INF/leiningen/scout/scout/README.md
11252	Feb	10	META-INF/leiningen/scout/scout/LICENSE
0	Feb	10	META-INF/
0	Feb	10	META-INF/maven/
0	Feb	10	META-INF/maven/scout/
0	Feb	10	META-INF/maven/scout/scout/
136	Feb	10	META-INF/maven/scout/scout/pom.properties
0	Aug	19	scout/
6514	Aug	19	scout/core.clj

Running a Clojure JAR directly

```
$ java -cp \           # Invoke Java, specify a classpath  
    /usr/share/java/clojure.jar:/usr/share/java/scout.jar \  
    clojure.main \      # Run clojure.main  
    -e '(use '""'"scout.core)' # Pass it some code
```

```
WARNING: peek already refers to: #'clojure.core/peek  
in namespace: user, being replaced by:  
#'scout.core/peek
```

```
$ echo $?
```

```
0
```

Things this taught me about how Clojure works

1) Clojure is a single jar.

Invoking the main function runs the compiler.

2) Clojure finds dependencies via inclusion on the Java classpath.

3) Clojure libraries are (usually) source code tarballs.

Demo: Build Scout

```
jh_classpath
jh_manifest
jh_exec
jh_depends
mh_installpoms
mh_linkjars --skip-clean-poms
dh_strip_nondeterminism
dh_compress
dh_fixperms
dh_missing
dh_installdeb
dh_gencontrol
dh_md5sums
dh_builddeb
dpkg-deb: building package 'libscout-clojure' in '../libscout-clojure_0.1.1-4_al
l.deb'.
dpkg-genbuildinfo
dpkg-genchanges >../scout-clojure_0.1.1-4_amd64.changes
dpkg-genchanges: info: not including original source code in upload
dpkg-source -i -I --after-build scout
dpkg-buildpackage: info: binary and diff upload (original source NOT included)
Now running lintian scout-clojure_0.1.1-4_amd64.changes ...
Finished running lintian.
ehashman@corn-syrup:~/debian/scout$
```

Step 6: Upload the dependencies.

Step 7: Package Leiningen.



Name	Last commit	Last update
📁 .circleci	Add circleci config.yml.	9 months ago
📁 bin	Release 2.8.1	3 months ago
📁 debian	Release version 2.8.1-4	a month ago
📁 doc	Remove cgroups faq.	3 months ago
📁 lein-pprint	refer to '1.1.2'	a year ago
📁 <u>leiningen-core</u>	Release 2.8.1	3 months ago
📁 resources	Add tests from pedantic lib as well.	8 months ago
📁 <u>src/leiningen</u>	Revert "Type-hint and print metadata of form used ..."	3 months ago
📁 test	Add test showing that empty values can be set und...	4 months ago
📁 test_projects	Add test for deploying to a file repo	a year ago
📄 .gitattributes	Added .gitattributes to avoid autocrlf for bat files	7 years ago
📄 .gitignore	Add circleci config.yml.	9 months ago
📄 CONTRIBUTING.md	Gitorious isn't a thing any more.	9 months ago

Step 7.1: Set your hair on fire.

**Debian benefit #3: making sure
upstream actually builds from source**

“Hasn't anyone tried to
build this from source?!”

“no.” – *Ancient Debian proverb*

%:

```
dh $@ --with javahelper --buildsystem=maven
```

override_dh_auto_build:

```
cp resources/leiningen/bootclasspath-deps.clj \
    leiningen-core/src/leiningen/bootclasspath-deps.clj
dh_auto_build -- -f leiningen-core/pom.xml install
echo $(LEIN_BOOTSTRAP) > leiningen-core/.lein-bootstrap
chmod a+x bin/lein
bin/lein uberjar
bin/lein pom
cp bin/lein bin/lein-standalone
cp bin/lein-pkg bin/lein
```

Jars needed to bootstrap leiningen, one per line, with
debian/maven-repo/ removed.

BOOTSTRAP_JARS=

```
leiningen-core/leiningen-core/$(VER)/leiningen-core-$(VER).jar \  
bultitude/bultitude/debian/bultitude-debian.jar \  
com/google/guava/guava/debian/guava-debian.jar \  
com/hypirion/io/debian/io-debian.jar \  
commons-io/commons-io/debian/commons-io-debian.jar \  
...  
org/apache/maven/maven-model/3.x/maven-model-3.x.jar \  
org/clojure/clojure/debian/clojure-debian.jar \  
org/clojure/data.xml/debian/data.xml-debian.jar \  
org/jsoup/jsoup/debian/jsoup-debian.jar \  
org/slf4j/slf4j-api/debian/slf4j-api-debian.jar \  
org/slf4j/slf4j-nop/debian/slf4j-nop-debian.jar \  
org/tcrawley/dynapath/debian/dynapath-debian.jar \  
robert/hooke/debian/hooke-debian.jar
```

Demo: Build Leiningen

```
dh_depends -O--buildsystem=maven
dh_compress -O--buildsystem=maven
dh_fixperms -O--buildsystem=maven
dh_missing -O--buildsystem=maven
dh_installdeb -O--buildsystem=maven
dh_gencontrol -O--buildsystem=maven
dpkg-gencontrol: warning: package leiningen: unused substitution variable ${mave
n:Depends}
dh_md5sums -O--buildsystem=maven
dh_builddeb -O--buildsystem=maven
dpkg-deb: building package 'leiningen' in '../leiningen_2.8.1-4_all.deb'.
dpkg-genbuildinfo
dpkg-genchanges >../leiningen-clojure_2.8.1-4_amd64.changes
dpkg-genchanges: info: not including original source code in upload
dpkg-source -i -I --after-build leiningen-clojure
dpkg-source: info: unapplying 0004-Bump-commons-io-version.patch
dpkg-source: info: unapplying 0003-Update-LEIN_JAR-location-to-match-installed-j
ar.patch
dpkg-source: info: unapplying 0002-Fix-source-directory-in-POM.patch
dpkg-source: info: unapplying 0001-Build-in-offline-mode-with-local-repo.patch
dpkg-buildpackage: info: binary and diff upload (original source NOT included)
Now running lintian leiningen-clojure_2.8.1-4_amd64.changes ...
Finished running lintian.
```

Step 8: Upload leiningen.

**Step 8.1: Get rejected by
FTP Master for not writing down
your name in the copyright file.**

Step 8.2: Re-upload and get ACCEPTed!!

You can `apt-get install` it!

```
root@corn-syrup:~# apt-get install leiningen
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  leiningen
0 upgraded, 1 newly installed, 0 to remove and 214 not upgraded.
Need to get 0 B/13.0 MB of archives.
After this operation, 14.9 MB of additional disk space will be used.
Selecting previously unselected package leiningen.
(Reading database ... 452238 files and directories currently installed.)
Preparing to unpack .../leiningen_2.8.1-4_all.deb ...
Unpacking leiningen (2.8.1-4) ...
Setting up leiningen (2.8.1-4) ...
Processing triggers for man-db (2.7.6.1-4) ...
root@corn-syrup:~# which lein
/usr/bin/lein
root@corn-syrup:~# █
```

What's next from here?

- Clojure 1.9 ☺
- `tools.deps` and `clj` wrapper
- Boot
- Debian build helper for Leiningen
- Offer help to other distros (e.g. Fedora)
- Fixing bugs and keeping at it!

The Debian Clojure Team

- **Apollon Oikonomopoulos:** PuppetDB Server
- **Elana Hashman:** Leiningen, Clojure
- **Emmanuel Bourg:** kept all the unmaintained packages alive
- **Rob Browning:** Emacs
- **Sean Whitton:** CIDER
- **Tom Marble:** Boot

What a long, strange trip it's been.

Questions?

Thank you!

Thanks to: Clint Adams, Frances Hocutt, Rackspace

*Talk page with slides, further reading, etc.
will soon be up at: <https://hashman.ca/talks>*