



# INSTALLING R AND CRAN BINARIES ON UBUNTU

COMPOUNDING MANY SMALL CHANGES FOR LARGER EFFECTS

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T<sup>4</sup> Video Lightning Talk #006 and R<sup>4</sup> Video #5

Jun 21, 2020

## R PACKAGE INSTALLATION ON LINUX

- *In general* installation on Linux is from source, which can present an additional hurdle for those less familiar with package building, and/or compilation and error messages, and/or more general (Linux) (sys-)admin skills
- *That said* there have always been some binaries in some places; Debian has a few hundred in the distro itself; and there have been at least three distinct ‘cran2deb’ automation attempts
- (Also of note is that Fedora recently added a user-contributed repo pre-builds of all 15k CRAN packages, which is laudable. I have no first- or second-hand experience with it)
- I have written about this at length (see previous  $R^4$  posts and videos) but it bears repeating

## Three different ways

- **Barebones** empty Ubuntu system, discussing the setup steps
- Using **r-ubuntu** container with previous setup pre-installed
- The new kid on the block: **r-rspm** container for RSPM

## One Important Point

- We show container use here because Docker allows us to “simulate” an empty machine so easily
- But **nothing** we show here is limited to Docker
- *i.e.* **everything works** the same on a corresponding Ubuntu system: your laptop, server or cloud instance
- It is also transferable between Ubuntu releases (within limits: apparently still no RSPM for the now-current Ubuntu 20.04)

## In a nutshell

- We run *one* command, a shell script (in the repo)
- It does four things:
  - prepare for addition of a PPA
  - add the c2d4u (“CRAN-to-Deb-For-Ubuntu”) PPA
  - add R Ubuntu binaries via CRAN mirror repo
  - install package ‘tidyverse’
- Details on the next package and in t4 repo

## fromBasicUbuntuToTidyverse/usingDebBinaries.sh

```
#!/bin/bash

## this assumes we run as root, so run the script under sudo or use sudo on each command here
##
## for more details on this consult https://cloud.r-project.org/bin/linux/ubuntu/README.html

## Step One: turn of interactive install, affects only one question for default timezone
export DEBIAN_FRONTEND=noninteractive

## Step Two: update listings and install helper for PPAs
apt update && apt install -y software-properties-common

## Step Three: add 'c2d4u' ie the 'cran2deb4ubuntu' PPA, using the the R 4.0 variant
add-apt-repository -y ppa:c2d4u.team/c2d4u4.0+

## Step Four: also install R itself via CRAN mirror: add apt entry and key
## note we select Ubuntu 20.04 (aka "focal") here, adjust for other releases
echo "deb https://cloud.r-project.org/bin/linux/ubuntu focal-cran40/" > /etc/apt/sources.list.d/cran.list
apt-key adv --keyserver keyserver.ubuntu.com --recv-keys E298A3A825C0D65DFD57CBB651716619E084DAB9

## Step Five: update listing again and install e.g. tidyverse which will also install R itself
apt update && apt install -y r-cran-tidyverse
```

### In a nutshell

- The `r-ubuntu` Rocker container already contains all the setup
- It also already contains base R
- So we just install `r-cran-tidyverse`

### fromRUbuntuToTidyverse/usingDebBinaries.sh

```
#!/bin/bash

## this assumes we run as root, so run the script under sudo or use sudo on each command here
##
## this script runs inside the _pre-made_ rocker/r-ubuntu:20.04 container so the previous
## steps one to four are already taken care of

## Step One: update listing and install e.g. tidyverse which will also install R itself
apt update && apt install -y r-cran-tidyverse
```



### In a nutshell

- RStudio now offers RSPM
- Probably fair to say that this is primarily a paid service
- I can definitely see a market for this
- With proper setup, we can use it too
- Rocker container `r-rspm:18.04` does so for Ubuntu 18.04
- As of now, no word about RSPM & Ubuntu 20.04

### fromRSPMtoTidyverse/usingRSPMBinaries.sh

```
#!/bin/bash

## this assumes we run as root, so run the script under sudo or use sudo on each command here
##
## this script runs inside the _pre-made_ rocker/r-rspm:18.04 container so the RSPM backend
## is already setup

## Step One: use littler wrapper 'install.r' to call install.packages() for us
install.r tidyverse

## alternatively, in R, say  install.packages("tidyverse")
##
## note, though, that RSPM is _not_ connected to the system package manager so some
## system level libraries may be missing -- here we already loaded libxm2 to ensure
## tidyverse and its sub-packages can be loaded; for other packages other libraries
## may be needed.  our (nascent) chshshli package tries to help here.
```

## Maybe Emacs, at last?

- A few more topics especially for Emacs in mind
- But we may also take a break and come back later
- Fall is a teaching term for me so limited Sunday time...

# SERIES RESOURCE

The screenshot shows the GitHub repository page for 'eddelbuettel/t4'. At the top, there are navigation links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The repository name 'eddelbuettel / t4' is displayed with 1 Unwatch, 0 Stars, and 0 Forks. Below this, there are statistics: 1 commit, 1 branch, 0 packages, 0 releases, and 1 contributor. A navigation bar includes 'Branch: master', 'New pull request', 'Create new file', 'Upload files', 'Find file', and 'Clone or download'. The commit history shows 'eddelbuettel' as the author of the 'initial commit' 31 seconds ago. The selected file is 'README.md', which contains the following text:

## t4: Tips, Trick, Tools and Toys

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### What Is This?

An informal series of *lightning talks* taped as videos and supported by a few slides. Focused on a few little ticks and tricks, or tools, or toys, to make computing life just that little bit easier.

### Schedule so far

with the [initial video](#) and [slides](#)

### What Else?

Please use the [issue tracker](#) to provide feedback, corrections, ideas, ...

### Who

Dirk Eddelbuettel

Source: <https://github.com/eddelbuettel/t4>

# THANK YOU!

slides <http://dirk.eddelbuettel.com/presentations/>

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twitter [@eddelbuettel](#)

repo <https://github.com/eddelbuettel/t4>

## The Docker aliases I currently use

```
## docker run and mount
## use -u `id -u`:`id -g` if unclear what uid:gid to use
alias dkrr='docker run --rm -ti -u1000:1000 -v$(pwd):/work -w /work'
alias dkrrr='docker run --rm -ti -v$(pwd):/work -w /work'
alias dkrrx='docker run --rm -it -u1000:1000 -e DISPLAY=$DISPLAY -v /tmp/.X11-unix:/tmp/.X11-unix'
```