



# REVERSE DEPENDS: SOME PRELIMINARY COMMENTS

DSC 2018 / R FOUNDATION SUMMIT 2018

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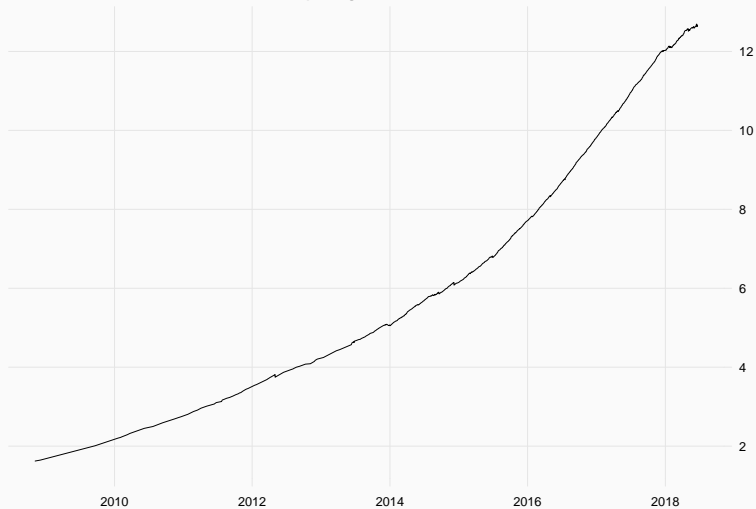
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9 July 2018

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Debian and R Projects

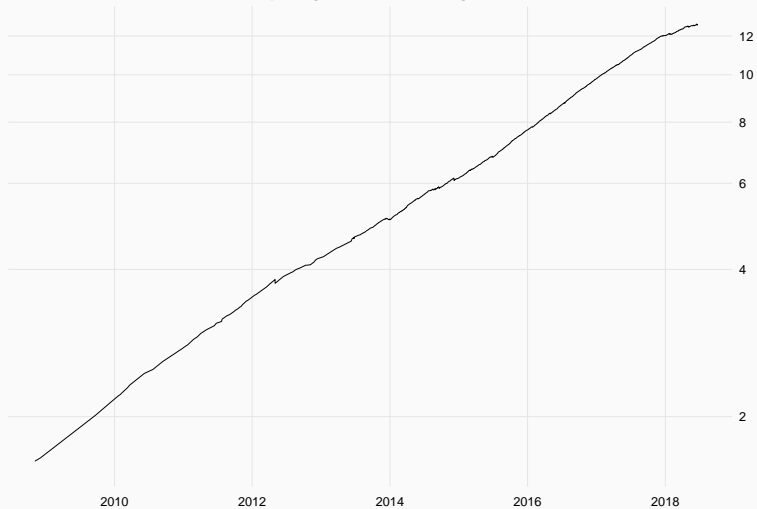
# CURRENT SITUATION

CRAN packages, in thousands



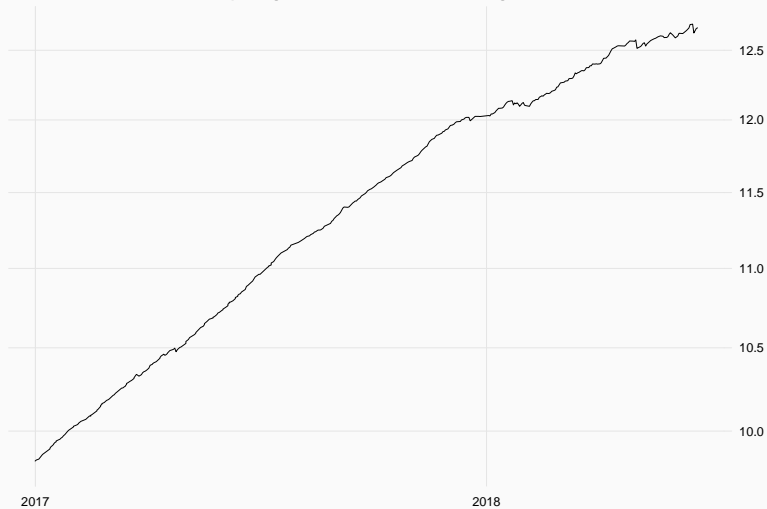
# CURRENT SITUATION

CRAN packages, in thousands, log scale



# CURRENT SITUATION

CRAN packages since 2017, in thousands, log scale



## Package Growth

- Still mostly-exponential growth at CRAN
- But CRAN team *smaller* than a few years ago
- Pressure on CRAN administrators
- Pressure on package authors

## Status Quo

- Expected to run prior to submission
- Not really documented
- “just look at packages tools and utils”
- devtools has one helper function ...
- ... which is a start but too slow / basic for advanced use

## COST OF TESTING

### No Free Lunch

- Single run on a decent machine now takes more than a workday
- Should be easy-ish to parallelize (given resources)
- But that has not yet happened.
- Is testing support a community thing? R Hub?

New(-ish) package

## Quick walk through

- Function to **enqueue**
- Function to **dequeue**
- Function to summarize
- No aggregation across time and runs yet



# PRRD EXAMPLE

```
jaeger_0.3 started at 2018-01-01 10:47:49.99 success at 2018-01-01 10:48:26.71 (36/0/0)
jdbm3_1.4.2 started at 2018-01-01 10:48:20.70 success at 2018-01-01 10:49:23.26 (31/0/0)
generalizedtridiagonal_0.9.5 started at 2018-01-01 10:49:23.99 success at 2018-01-01 10:50:35.78 (32/0/0)
GeneralTools_0.2.6 started at 2018-01-01 10:50:35.89 success at 2018-01-01 10:53:20.75 (33/0/0)
jlm2_1.1.7 started at 2018-01-01 10:53:20.86 success at 2018-01-01 10:55:54.33 (34/0/0)
prow_0.2.1 started at 2018-01-01 10:55:48.91 success at 2018-01-01 10:57:32.66 (35/0/0)
gpbaso_1.3-3 started at 2018-01-01 10:57:32.75 success at 2018-01-01 10:58:43.53 (36/0/0)
hiveDemos_1.0.6 started at 2018-01-01 10:58:43.64 success at 2018-01-01 10:59:32.24 (37/0/0)
kronos_1.0.6 started at 2018-01-01 10:59:33.32 success at 2018-01-01 10:59:58.43 (38/0/0)
lccbeta_1.1.6 started at 2018-01-01 10:59:58.58 success at 2018-01-01 11:00:06.04 (39/0/0)
lcc_0.5 started at 2018-01-01 11:00:06.11 success at 2018-01-01 11:01:02.04 (40/0/0)
josephm_0.4.8 started at 2018-01-01 11:01:02.92 skipped at 2018-01-01 11:01:02.92 (40/1/0)
idcopula_0.9.1 started at 2018-01-01 11:01:03.80 success at 2018-01-01 11:02:03.69 (41/1/0)
lime_1.1.1 started at 2018-01-01 11:02:03.79 success at 2018-01-01 11:02:34.65 (42/1/0)
nanopyplot_1.0.4 started at 2018-01-01 11:02:34.19 success at 2018-01-01 11:03:14.58 (43/1/0)
matching_1.2.1 started at 2018-01-01 11:03:14.96 success at 2018-01-01 11:03:41.11 (44/1/0)
natvis_0.1.1 started at 2018-01-01 11:03:41.18 success at 2018-01-01 11:04:29.28 (45/1/0)
nct1_0.41 started at 2018-01-01 11:04:29.39
jannetMultiple_0.8.8 started at 2018-01-01 10:48:26.41 success at 2018-01-01 10:49:11.55 (21/0/0)
factorstoolbox_0.3 started at 2018-01-01 10:49:10.58 success at 2018-01-01 10:49:48.33 (22/0/0)
FBResearch_1.1 started at 2018-01-01 10:49:48.68 success at 2018-01-01 10:45:11.98 (23/0/0)
FDPRR_0.1 started at 2018-01-01 10:45:12.86 success at 2018-01-01 10:45:56.22 (24/0/0)
Flux_0.6 started at 2018-01-01 10:45:58.29 success at 2018-01-01 10:46:01.78 (25/0/0)
forecast_0.2 started at 2018-01-01 10:46:01.78 success at 2018-01-01 10:55:58.53 (26/0/0)
gmr_1.1 started at 2018-01-01 10:55:58.66 success at 2018-01-01 10:56:46.25 (27/0/0)
gpmv_3.0.4 started at 2018-01-01 10:56:46.38 success at 2018-01-01 10:57:58.41 (28/0/0)
gpl_2-0.8 started at 2018-01-01 10:57:58.89 success at 2018-01-01 10:58:58.45 (29/0/0)
HVESolver_0.1.1 started at 2018-01-01 10:58:58.84 success at 2018-01-01 10:59:10.88 (30/0/0)
HMM_0.4.4 started at 2018-01-01 11:01:06.65 success at 2018-01-01 11:03:32.32 (31/0/0)
Imbalance_0.1.1 started at 2018-01-01 11:00:01.83 success at 2018-01-01 11:00:44.99 (32/0/0)
JRM_0.1.0.8 started at 2018-01-01 11:00:45.97 success at 2018-01-01 11:01:06.58 (33/0/0)
KDDML_1.4 started at 2018-01-01 11:01:06.65 success at 2018-01-01 11:03:32.32 (34/0/0)
LAPL_0.22 started at 2018-01-01 11:01:03.24 success at 2018-01-01 11:02:32.52 (35/0/0)
ManifoldOptim_1.1 started at 2018-01-01 11:02:32.52 success at 2018-01-01 11:02:51.18 (36/0/0)
manhattan_0.6.9-1 started at 2018-01-01 11:02:51.23 success at 2018-01-01 11:04:32.88 (37/0/0)
mclustcore_2.0.2 started at 2018-01-01 11:04:32.94
jpop_1.0.3 started at 2018-01-01 10:48:41.29 success at 2018-01-01 10:53:17.44 (27/0/0)
kde_1.0 started at 2018-01-01 10:53:17.54 success at 2018-01-01 10:54:21.28 (28/0/0)
GLMSPR_1.0 started at 2018-01-01 10:54:21.31 success at 2018-01-01 10:55:03.32 (29/0/0)
jlmprob_0.3 started at 2018-01-01 10:55:03.42 success at 2018-01-01 10:57:29.86 (30/0/0)
gradMKT_0.5 started at 2018-01-01 10:57:29.14 success at 2018-01-01 10:57:35.13 (31/0/0)
gradYEPF_1.1 started at 2018-01-01 10:57:35.20 success at 2018-01-01 10:57:59.14 (32/0/0)
prow_0.2.1 started at 2018-01-01 10:57:59.24 success at 2018-01-01 10:58:34.41 (33/0/0)
gymth_1.0.6 started at 2018-01-01 10:58:34.73 success at 2018-01-01 10:58:43.48 (34/0/0)
hesis_1.0 started at 2018-01-01 10:58:43.46 success at 2018-01-01 10:59:08.66 (35/0/0)
hognpvr_0.1 started at 2018-01-01 10:59:08.72 success at 2018-01-01 11:00:01.21 (36/0/0)
hubs_2.0.1 started at 2018-01-01 10:59:08.48 success at 2018-01-01 10:59:52.69 (37/0/0)
lccnet_0.3 started at 2018-01-01 10:59:52.76 success at 2018-01-01 11:00:58.84 (38/0/0)
lccnet1.1 started at 2018-01-01 11:00:58.91 success at 2018-01-01 11:01:51.64 (39/0/0)
libra_0.1.5 started at 2018-01-01 11:01:51.71 success at 2018-01-01 11:01:54.88 (40/0/0)
largefibs_0.2.1 started at 2018-01-01 11:01:54.14 success at 2018-01-01 11:02:52.89 (41/0/0)
MVT_0.2 started at 2018-01-01 11:02:52.97 success at 2018-01-01 11:03:41.11 (42/0/0)
MATCHES_1.0 started at 2018-01-01 11:03:41.16 success at 2018-01-01 11:04:40.37 (43/0/0)
MAVE_1.2.0 started at 2018-01-01 11:04:40.44 success at 2018-01-01 11:04:49.65 (44/0/0)
MSE_0.4.4.5 started at 2018-01-01 11:04:49.67
wsh_17.04.0 - 3:lbash 2:3bash 3:4bash 4:5bash 5:6bash 6:7bash 7:8bash 8:9bash 9:10bash 10:11bash
DITfusionIqnd_0.1.1 started at 2018-01-01 10:48:15.92 success at 2018-01-01 10:48:38.86 (16/0/0)
dhwet_1.3.0 started at 2018-01-01 10:48:58.94 success at 2018-01-01 10:49:26.85 (17/0/0)
fastLink_0.2 started at 2018-01-01 10:49:26.72 success at 2018-01-01 10:49:37.71 (18/0/0)
fca_1.1-0 started at 2018-01-01 10:49:37.79 success at 2018-01-01 10:49:56.14 (19/0/0)
FPGA_C1_1.1 started at 2018-01-01 10:49:56.21 success at 2018-01-01 10:49:56.21 (20/0/0)
flp_2.4.1 started at 2018-01-01 10:49:56.72 success at 2018-01-01 10:49:56.72 (21/0/0)
FHESA_CAD_2.1.1 started at 2018-01-01 10:47:16.33 success at 2018-01-01 10:48:16.30 (19/0/0)
Gastro_0.2.2 started at 2018-01-01 10:48:16.39 success at 2018-01-01 10:55:38.58 (20/0/0)
GCMC_1.2.4 started at 2018-01-01 10:55:38.57 success at 2018-01-01 10:57:10.64 (21/0/0)
graphicalVAR_0.2.1 started at 2018-01-01 10:57:10.63 success at 2018-01-01 10:58:19.93 (22/0/0)
Giant_2.0.5 started at 2018-01-01 10:58:20.92 success at 2018-01-01 10:59:29.45 (23/0/0)
BATCA_1.3 started at 2018-01-01 10:59:29.54 success at 2018-01-01 11:00:09.46 (24/0/0)
lcca_0.2.2 started at 2018-01-01 11:00:09.52 success at 2018-01-01 11:00:42.35 (25/0/0)
JAGMR_0.3.1 started at 2018-01-01 11:00:42.93 success at 2018-01-01 11:01:34.21 (26/0/0)
jagm_1.3.3 started at 2018-01-01 11:01:34.27 success at 2018-01-01 11:02:02.38 (27/0/0)
lowmemkmeans_0.1.2 started at 2018-01-01 11:02:02.99 success at 2018-01-01 11:02:17.76 (28/0/0)
luminescence_0.7.5 started at 2018-01-01 11:02:17.86 success at 2018-01-01 11:04:35.10 (29/0/0)
mexce_1-3-2 started at 2018-01-01 11:04:35.27
GADG_0.9.0 started at 2018-01-01 10:47:34.98 success at 2018-01-01 10:47:56.82 (16/0/0)
gmslect_1.0.3 started at 2018-01-01 10:47:56.88 success at 2018-01-01 10:48:25.15 (17/0/0)
gkGrig_1.1.1 started at 2018-01-01 10:48:25.25 success at 2018-01-01 10:48:58.57 (18/0/0)
gso4_0.1.0.0 started at 2018-01-01 10:48:58.65 success at 2018-01-01 10:53:07.32 (22/0/0)
gposjorn_1.0.4 started at 2018-01-01 10:53:07.46 success at 2018-01-01 10:53:51.65 (23/0/0)
gudic_0.1.3.0 started at 2018-01-01 10:53:51.43 success at 2018-01-01 10:55:43.66 (24/0/0)
Guedian_1.2.4 started at 2018-01-01 10:55:43.77 success at 2018-01-01 10:56:48.88 (25/0/0)
glax_1.3.0 started at 2018-01-01 10:56:48.88 success at 2018-01-01 10:57:55.65 (26/0/0)
groucvrucs_0.2.4.1 started at 2018-01-01 10:57:57.12 skipped at 2018-01-01 10:57:57.12 (26/1/0)
groufunctions_0.13 started at 2018-01-01 10:57:57.20 skipped at 2018-01-01 10:57:57.20 (26/2/0)
GSCD_0.1.1 started at 2018-01-01 10:57:57.20 success at 2018-01-01 10:58:01.69 (27/0/0)
Havp_1.1.4 started at 2018-01-01 10:58:01.67 success at 2018-01-01 10:59:28.17 (28/0/0)
hervpulsive_2.0.8 started at 2018-01-01 10:59:28.24 success at 2018-01-01 11:00:44.76 (29/0/0)
Homes_0.7.8 started at 2018-01-01 11:00:44.89 success at 2018-01-01 11:00:44.89 (30/0/0)
judic_0.1.5 started at 2018-01-01 11:00:44.92 success at 2018-01-01 11:02:06.73 (31/0/0)
matchingMarkets_0.3.3 started at 2018-01-01 11:02:06.85 success at 2018-01-01 11:03:54.45 (32/0/0)
MatrixTools_1.1 started at 2018-01-01 11:03:54.52 success at 2018-01-01 11:04:50.51 (33/0/0)
mcsGM_1.1 started at 2018-01-01 11:04:50.66
hmp_0.1.0.4 started at 2018-01-01 10:49:21.99 success at 2018-01-01 10:49:11.99 (27/0/0)
MEASUP_1.0.2 started at 2018-01-01 10:49:12.86 success at 2018-01-01 10:49:51.57 (30/0/0)
genmlChatting_1.3 started at 2018-01-01 10:49:51.60 success at 2018-01-01 10:50:40.45 (29/0/0)
FPGA_C2_1.1 started at 2018-01-01 10:50:40.55 success at 2018-01-01 10:50:52.71 (30/0/0)
KERON_0.11.2 started at 2018-01-01 10:51:51.57 success at 2018-01-01 10:53:33.75 (31/0/0)
kmlanlasso_2.0.1 started at 2018-01-01 10:53:33.85 success at 2018-01-01 10:54:07.38 (32/0/0)
kronos_1.0.6 started at 2018-01-01 10:54:07.48 success at 2018-01-01 10:54:52.89 (33/0/0)
libPrp_0.8-51 started at 2018-01-01 10:55:03.81 success at 2018-01-01 10:56:26.74 (34/0/0)
gold_1.0.1 started at 2018-01-01 10:56:26.82 success at 2018-01-01 10:57:40.48 (35/0/0)
GresyBTRM_1.0 started at 2018-01-01 10:57:40.57 success at 2018-01-01 10:58:01.16 (36/0/0)
KSE_4.1 started at 2018-01-01 10:58:01.27 success at 2018-01-01 10:58:35.82 (37/0/0)
hawkes_0.9.4 started at 2018-01-01 10:58:35.88 success at 2018-01-01 10:58:51.82 (38/0/0)
hblm_1.3.1 started at 2018-01-01 10:58:51.83 success at 2018-01-01 10:59:52.71 (39/0/0)
Laplace_1.1.0 started at 2018-01-01 10:59:53.78 success at 2018-01-01 11:00:05.33 (40/0/0)
interfex_1.0.3 started at 2018-01-01 11:00:05.17 success at 2018-01-01 11:01:03.21 (41/0/0)
genml_1.0.7 started at 2018-01-01 11:01:03.21 success at 2018-01-01 11:02:16.97 (42/0/0)
lsp_1.1.6 started at 2018-01-01 11:02:16.84 success at 2018-01-01 11:03:43.07 (43/0/0)
MatrixCorrelation_0.9.2 started at 2018-01-01 11:03:43.06 success at 2018-01-01 11:04:34.52 (44/0/0)
MSE_0.4.4.5 started at 2018-01-01 11:04:34.54
Z13ash 13:13sh 14:14bash 15:15bash 16:16ash 17:17bb 18:18bb 19:19bb 20:20ash 21:21ash 22:22ash 23:23sh 24:24bash 25:25ash 26:26ash 27:27sh 28:28ash 29:29ash 30:30ash 31:31sh 32:32sh 33:33sh 34:34bash 35:35ash 36:36ash 37:37bb 38:38bb 39:39bb 40:40ash 41:41ash 42:42ash 43:43sh 44:44bash 45:45ash 46:46ash 47:47bb 48:48bb 49:49bb 50:50ash 51:51ash 52:52ash 53:53sh 54:54bash 55:55ash 56:56ash 57:57sh 58:58ash 59:59ash 60:60ash 61:61sh 62:62sh 63:63sh 64:64sh 65:65sh 66:66sh 67:67sh 68:68sh 69:69sh 70:70sh 71:71sh 72:72sh 73:73sh 74:74sh 75:75sh 76:76sh 77:77sh 78:78sh 79:79sh 80:80sh 81:81sh 82:82sh 83:83sh 84:84sh 85:85sh 86:86sh 87:87sh 88:88sh 89:89sh 90:90sh 91:91sh 92:92sh 93:93sh 94:94sh 95:95sh 96:96sh 97:97sh 98:98sh 99:99sh 100:100sh
```

```
$ git/prrd/inst/scripts/enqueueJobs.r \  
    -q tmp/queues/ RcppArmadillo
```

which calls (after `docopt` argument processing)

```
prrd::enqueueJobs(opt$PACKAGE, opt$queue)
```

```
$ git/prrd/inst/scripts/dequeueJobs.r \  
    -q tmp/queues/ RcppArmadillo
```

which calls (after `docopt` argument processing)

```
prrd::dequeueJobs(opt$PACKAGE, opt$queue, opt$exclude)
```

```
$ git/prrd/inst/scripts/summariseJobs.r \  
    tmp/queues/Rcpp_2018-06-23/queuefile.sqlite -e -f
```

which calls (after `docopt` argument processing)

```
prrd::summariseQueue(opt$package, "",  
                    dbfile=opt$QUEUEFILE,  
                    extended=opt$extended)
```

```
Test of RcppArmadillo had 463 successes, 3 failures, and 15 skipped packages.  
Ran from 2018-06-27 11:08:50.85 to 2018-06-27 14:13:30.38 for 3.078 hours  
Average of 23.034 secs relative to 137.058 secs using 6 runners
```

```
Failed packages:  catSurv, DDPGPSurv, saeRobust
```

```
Skipped packages: cliqueMS, dynamichazard, growcurves, growfunctions, joineRML, miceadds, \  
Morpho, mrgsolve, nlmixr, pcalg, rFTRLProximal, riskRegression, RStoolbox, Rvcg, RxODE
```

```
None still working
```

```
None still scheduled
```

```
Error summary:
```

	package	missingPkg	badInstall	error	fail	warn	note	ok	hasOtherIssue	
1:	catSurv		FALSE	0	0	0	12	0	TRUE	
2:	DDPGPSurv	'mc2d'	NA	NA	NA	NA	NA	NA	NA	passes once installed
3:	saeRobust		FALSE	0	0	0	0	12	FALSE	

Results (queues and summaries) pushed to [repo rcpp-logs](#).

## Category in CRAN-robot emails

- Useful metric
- How can we support it?
- Comparison across time / runs in **prrd**

For reverse depends

- Maybe
- Plan ?
- Contributors ?
- CRAN integration ?

## CHANGE IN TESTING?

### No Free Lunch

- Do we need to rethink testing?
  - only packages which themselves are impactful? (*maybe*)
  - only packages which were updated recently? (*maybe not*)
  - only packages which may have failed in the past? (*possibly*)
  - other ways to subsample?
- This both an engineering and a statistics questions so ...



## TESTS NO BE ALL END ALL

### Still No Free Lunch

- Tests really only run the code they cover
- Rcpp has e.g. code generators, we generally do not regenerate *in client packages*
- The *one minute cap* via CRAN Policy means we **suppress tests**

## Where to go from here

- Anybody else interested ?
- More open questions than answers

# THANK YOU!

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

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