



Continuous/Deployment (CI/CD) for R

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Introduction

- **Version Control in Analytics**
- **Continuous Integration**
- **Continuous Deployment**

Version Control

- Version Control in Analytics?
- Benefits
- Integrate Analytics Feedback Life Cycle with SDLC
 - Software Development Life Cycle
 - Define Requirements, Design, Development, QA, UAT, Release
 - Analytics Development Life Cycle
 - Identify Problem, Data Prep, Explore, Transform, Select, Modeling, Validate Models, Deploy, Monitor Results

Continuous Integration (CI)

- CI?
- Benefits



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IT WORKS
on my machine

Continuous Deployment

- CD?
- Testing
- Delivery

The workings – R/Studio

```
> library(usethis)
> prjpath <- file.path("~/gitlab/gaspdemo", "gaspdemo")
> usethis::create_package("~/gitlab/gaspdemo")
✓ Setting active project to 'C:/Users/Westat/gitlab/gaspdemo'
✓ Creating 'R/'
✓ Creating 'man/'
✓ Writing 'DESCRIPTION'
✓ Writing 'NAMESPACE'
✓ Changing working directory to 'C:/Users/Westat/gitlab/gaspdemo'
```

```
> usethis::use_roxygen_md()
✓ Setting Roxygen field in DESCRIPTION to 'list(markdown = TRUE)'
✓ Setting RoxygenNote field in DESCRIPTION to '6.1.0'
• Run `devtools::document()`
> usethis::edit_file("DESCRIPTION")
• Modify 'DESCRIPTION'
```

```
Package: gaspdemo
Title: Package Developed For CICD Demonstration
Version: 0.0.0.9000
Authors@R:
  person(given = "Zech",
         family = "Kottlilil",
         role = c("aut", "cre"),
         email = "me@anon.org")
Description: This package is developed to demonstrate the
  continuous integration and deployment from within R.
Encoding: UTF-8
LazyData: true
RoxygenNote: 6.1.0|
```

```
> usethis::use_r("gasp_hello")
• Modify 'R/gasp_hello.R'
```

The workings – R/Studio (contd.)

```
#' Show the CI/CD functionality
#
#' @param x The name of the Person who is being welcomed
#
#' @return The output from \link{print}
#
#' @export
#
#' @examples
#' hellox("Zech")
#' \dontrun{
#' hellox("Rose")
#' }

hellox <- function(x) {
  print(paste0("Hello, ", x, "! Welcome to the world of CI/CD at GASP!"))
}
```

■ Add Unit Test

```
> usethis::use_testthat()
✓ Adding 'testthat' to Suggests field in DESCRIPTION
✓ Creating 'tests/testthat/'
✓ Writing 'tests/testthat.R'
> usethis::use_test(name = "gasp_hello.R")
✓ Writing 'tests/testthat/test-gasp_hello.R'
● Modify 'tests/testthat/test-gasp_hello.R'
```

```
context("Just Testing Functionality")

test_that("Whether the hello gives us the same output", {
  res = hellox("Zech")
  expect_output(hellox("Zech"), "Hello, Zech! Welcome to the world of CI/CD at GA
})
```


The workings – R/Studio (contd.)

- Test the Package

```
> devtools::test()
Loading gaspdemo
Loading required package: testthat
Testing gaspdemo
√ | OK F W S | Context
/ | 0       | Just Testing Functionality[1] "Hello, Zech! Welcome to the world$
√ | 1       | Just Testing Functionality

== Results ==
OK:      1
Failed:  0
Warnings: 0
Skipped: 0
```

- Run a Check

```
* checking for unstated dependencies in 'tests' ... OK
* checking tests ...
  Running 'testthat.R'
  OK
* DONE

Status: OK

R CMD check results
0 errors | 0 warnings | 0 notes
```


The workings – R/Studio (contd.)

- Add a YAML file (.gitlab-ci.yml) for the CI to the project folder

```
image: r-base

test:
  script:
    - R -e 'install.packages(c("testthat"))'
    - R CMD build . --no-build-vignettes --no-manual
    - R CMD check *tar.gz --no-build-vignettes --no-manual
```

- Initialize the GitLab Repository and Commit

```
> usethis::use_build_ignore(".gitlab-ci.yml")
✓ Adding '^\\.gitlab-ci\\.yml$' to '.Rbuildignore'
> usethis::use_git()
✓ Initialising Git repo
✓ Adding '.Rhistory', '.RData', '.Rproj.user' to '.gitignore'
OK to make an initial commit of 9 files?
1: Not now
2: Yup
3: No

Selection: 2
✓ Adding files and committing
```

The workings – R/Studio (contd.)

- Push to GitHub from R/Studio.

```
C:\Users\Westat\gitlab\gaspdemo>git push --set-upstream https://gitlab.com/kottlils/gaspdemo.git master
Enumerating objects: 20, done.
Counting objects: 100% (20/20), done.
Delta compression using up to 4 threads.
Compressing objects: 100% (15/15), done.
Writing objects: 100% (20/20), 3.70 KiB | 631.00 KiB/s, done.
Total 20 (delta 0), reused 0 (delta 0)
remote:
remote: The private project kottlils/gaspdemo was successfully created.
remote:
remote: To configure the remote, run:
remote:   git remote add origin https://gitlab.com/kottlils/gaspdemo.git
remote:
remote: To view the project, visit:
remote:   https://gitlab.com/kottlils/gaspdemo
remote:
To https://gitlab.com/kottlils/gaspdemo.git
* [new branch]      master -> master
Branch 'master' set up to track remote branch 'master' from 'https://gitlab.com/kottlils/gaspdemo.git'.
```

The workings – GitLab


- After Push on GitLab

All Personal

G Zech Kottlil / gaspdemo Maintainer ✓ ★ 0 🔒
 updated 3 hours ago

CI / CD

All 1 Pending 0 Running 0 Finished 1 Branches Tags

| Status | Pipeline | Commit | Stages |
|-----------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------|
| ✓ passed | #33774279 by  latest | 🔑 master → 398d6572 ❄️ Initial commit | ✓ |

```
* checking tests ...
Running 'testthat.R'
OK
* DONE
```

Status: OK

Job succeeded



Enjoy CI/CD!

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