

Git with the program

Bioconductor's Git transition

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Bioc2017, July 26th 2017
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git is not a joke, it's a commit.

Follow this demo

Use your computer

Ask questions

The problem with git jokes is that everyone has their own version.

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Differences between GIT and SVN

GIT

Everyone has a copy of the log.

Branching EASY :)

Local operations are FAST!

Enhanced Collaboration with Github

SVN

Server has a copy of the log.

Not so easy :(

Slow-er.

GIT-SVN bridge is painful.

GIT is not better than SVN, its just different and more suited to a community oriented way of software development.

git.bioconductor.org

Git knows what you did last summer!

Access rights

1. HTTPS (read only) permissions

2. SSH (read + write) permissions

Be careful not to remove the branch you're standing on

Using HTTPS (read only) permissions

```
In [1]: ! git clone https://git.bioconductor.org/packages/BiocStyle
```

```
Cloning into 'BiocStyle'...
remote: Counting objects: 1607, done.
remote: Compressing objects: 100% (1480/1480), done.
remote: Total 1607 (delta 977), reused 0 (delta 0)
Receiving objects: 100% (1607/1607), 268.99 KiB | 0 bytes/s, done.
Resolving deltas: 100% (977/977), done.
```

```
In [5]: ! git add random_change.txt
```

```
In [6]: ! git commit -m "add random change"
```

```
[master c409468] add random change
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 random_change.txt
```

```
In [21]: ! git status
```

```
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)
nothing to commit, working tree clean
```

```
In [7]: ! git push
```

```
fatal: remote error: FATAL: W any packages/BiocStyle nobody DENIED by fallthru
(or you mis-spelled the reponame)
```



How to maintain your
package using SSH.

Maintain your package

WITH



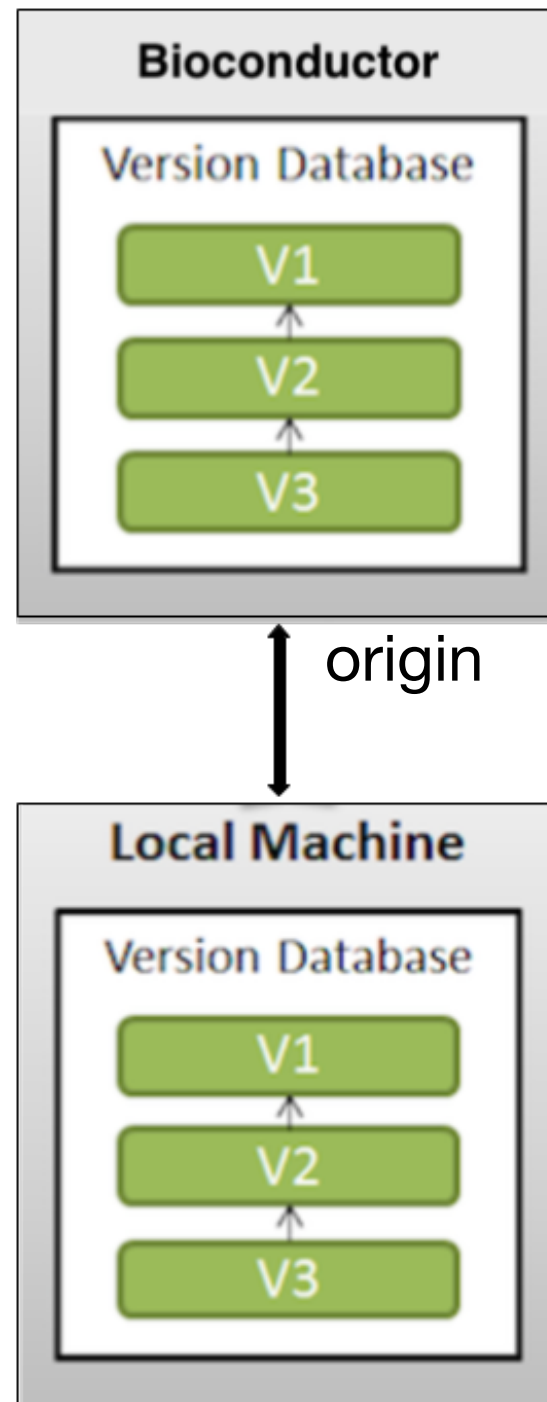
WITHOUT



YOU CHOOSE

We make it easy for you to maintain your package no matter where you are in your GIT journey.

Without GitHub



Using SSH (read + write) permissions / Maintain package only on Bioconductor (W/O Github)

```
In [2]: ! git clone git@git.bioconductor.org:packages/BiocGenerics
```

```
Cloning into 'BiocGenerics'...  
remote: Counting objects: 1520, done.  
remote: Compressing objects: 100% (1506/1506), done.  
remote: Total 1520 (delta 1089), reused 0 (delta 0)  
Receiving objects: 100% (1520/1520), 220.51 KiB | 0 bytes/s, done.  
Resolving deltas: 100% (1089/1089), done.
```

Branch structure of each package

```
In [4]: ! git branch -a
```

```
* master
  remotes/origin/HEAD -> origin/master
  remotes/origin/RELEASE_2_10
  remotes/origin/RELEASE_2_11
  remotes/origin/RELEASE_2_12
  remotes/origin/RELEASE_2_13
  remotes/origin/RELEASE_2_14
  remotes/origin/RELEASE_3_0
  remotes/origin/RELEASE_3_1
  remotes/origin/RELEASE_3_2
  remotes/origin/RELEASE_3_3
  remotes/origin/RELEASE_3_4
  remotes/origin/RELEASE_3_5
  remotes/origin/master
```

recent release



devel



```
In [19]: ! git add random_change.txt
```

```
In [20]: ! git commit -m "random change to BiocGenerics"
```

```
[master 03a97c2] random change to BiocGenerics
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 random_change.txt
```

```
In [21]: ! git status
```

```
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)
nothing to commit, working tree clean
```

```
In [17]: ! git push
```

```
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 298 bytes | 0 bytes/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To git.bioconductor.org:packages/BiocGenerics
63ba9cf..03a97c2  master -> master
```



Maintain your package on Github

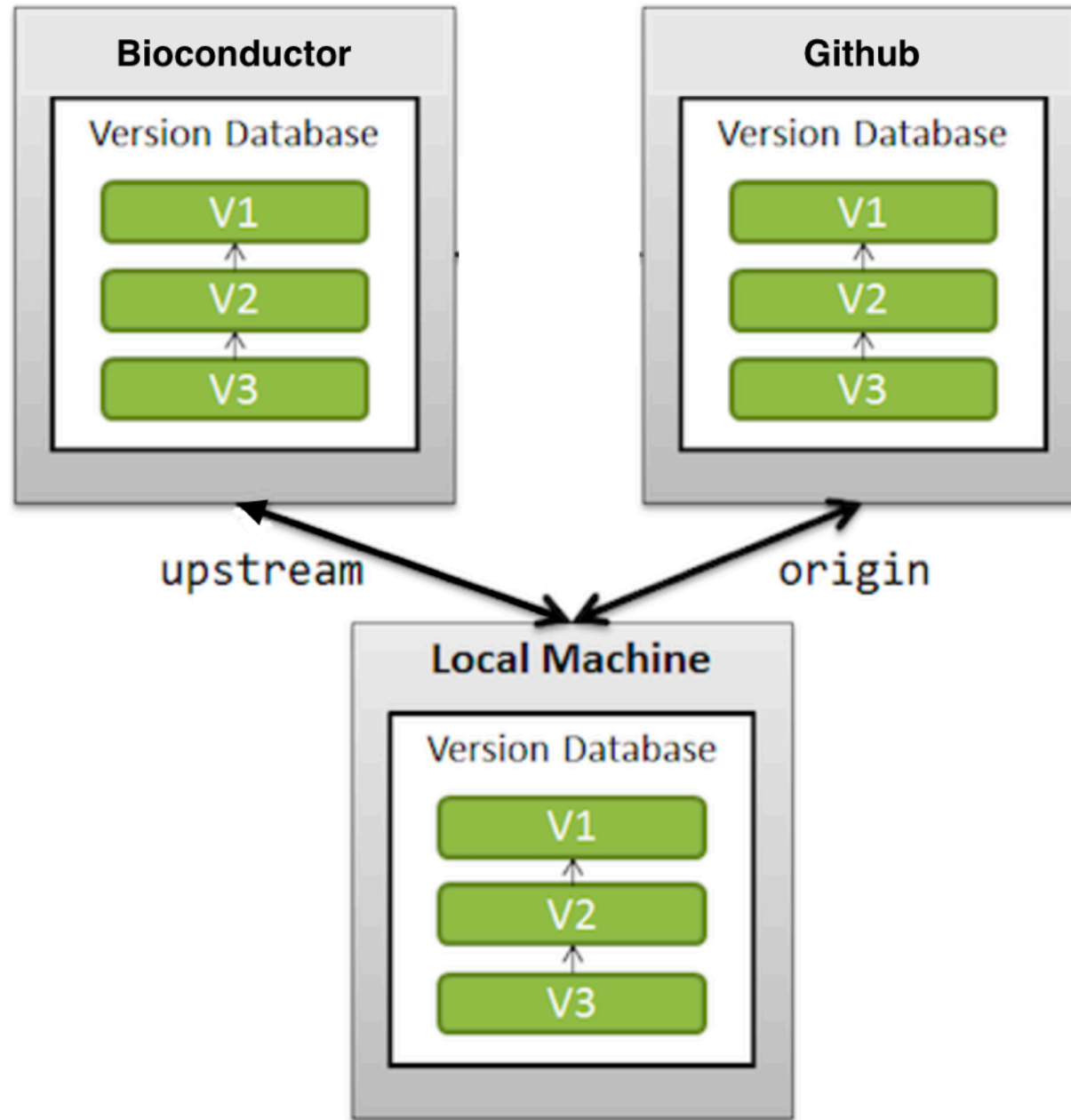
Clone from my local repository

```
In [9]: ! git clone git@github.com:nturaga/BiocGenerics
```

```
Cloning into 'BiocGenerics'...
remote: Counting objects: 1499, done.
remote: Compressing objects: 100% (405/405), done.
remote: Total 1499 (delta 1080), reused 1499 (delta 1080), pack-reused 0
Receiving objects: 100% (1499/1499), 216.20 KiB | 0 bytes/s, done.
Resolving deltas: 100% (1080/1080), done.
```

When I see a door with a push sign, i pull first to avoid conflicts !!!

With GitHub



```
In [14]: ! git remote -v
```

```
origin git@github.com:nturaga/BiocGenerics (fetch)  
origin git@github.com:nturaga/BiocGenerics (push)
```

```
In [15]: ! git remote add upstream git@git.bioconductor.org:packages/BiocGenerics
```

```
In [16]: ! git remote -v
```

```
origin git@github.com:nturaga/BiocGenerics (fetch)  
origin git@github.com:nturaga/BiocGenerics (push)  
upstream git@git.bioconductor.org:packages/BiocGenerics (fetch)  
upstream git@git.bioconductor.org:packages/BiocGenerics (push)
```

Add a new remote called “upstream” which refers to the Bioconductor server + the package location

```
In [18]: ! git fetch upstream
```

```
remote: Counting objects: 26, done.
remote: Compressing objects: 100% (26/26), done.
remote: Total 26 (delta 16), reused 0 (delta 0)
Unpacking objects: 100% (26/26), done.
From git.bioconductor.org:packages/BiocGenerics
* [new branch]      RELEASE_2_10 -> upstream/RELEASE_2_10
* [new branch]      RELEASE_2_11 -> upstream/RELEASE_2_11
* [new branch]      RELEASE_2_12 -> upstream/RELEASE_2_12
* [new branch]      RELEASE_2_13 -> upstream/RELEASE_2_13
* [new branch]      RELEASE_2_14 -> upstream/RELEASE_2_14
* [new branch]      RELEASE_3_0  -> upstream/RELEASE_3_0
* [new branch]      RELEASE_3_1  -> upstream/RELEASE_3_1
* [new branch]      RELEASE_3_2  -> upstream/RELEASE_3_2
* [new branch]      RELEASE_3_3  -> upstream/RELEASE_3_3
* [new branch]      RELEASE_3_4  -> upstream/RELEASE_3_4
* [new branch]      RELEASE_3_5  -> upstream/RELEASE_3_5
* [new branch]      master      -> upstream/master
```

```
In [19]: ! git merge upstream/master
```

```
Already up-to-date.
```

- Merge all **upstream/master** commits, into your local **master**.
- If the Bioconductor team makes any change i.e version bump, or a bug fix, you can merge it with your local master.
- But since there are no commits right now, it'll say "already up to date".
- If you see "Merge conflicts". This is where you'll see them. We have a section on how to avoid conflicts while merging, please check it out.

When you play the game of clones, you merge or you reset --hard.

```
In [20]: # Make more meaningful changes :D
! touch random_change.txt
```

```
In [21]: ls
```

```
DESCRIPTION          R/                   inst/                random_change.txt
NAMESPACE            TODO                 man/                 tests/
```

```
In [22]: ! git add random_change.txt
```

```
In [23]: ! git commit -m "Committing a random_change to show as an example"
```

```
[master 398f096] Committing a random_change to show as an example
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 random_change.txt
```

```
In [24]: ! git status
```

```
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)
nothing to commit, working tree clean
```

```
In [25]: # Use this to push to Github
```

```
! git push origin master
```

```
Counting objects: 3, done.
```

```
Delta compression using up to 4 threads.
```

```
Compressing objects: 100% (2/2), done.
```

```
Writing objects: 100% (3/3), 312 bytes | 0 bytes/s, done.
```

```
Total 3 (delta 1), reused 0 (delta 0)
```

```
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
```

```
To github.com:nturaga/BiocGenerics
```

```
63ba9cf..398f096 master -> master
```

```
In [26]: # Use this to push to Bioconductor
```

```
! git push upstream master
```

```
Counting objects: 3, done.
```

```
Delta compression using up to 4 threads.
```

```
Compressing objects: 100% (2/2), done.
```

```
Writing objects: 100% (3/3), 312 bytes | 0 bytes/s, done.
```

```
Total 3 (delta 1), reused 0 (delta 0)
```

```
To git.bioconductor.org:packages/BiocGenerics
```

```
63ba9cf..398f096 master -> master
```

```
In [41]: ! git checkout RELEASE_3_5
```

```
Branch RELEASE_3_5 set up to track remote branch RELEASE_3_5 from upstream.  
Switched to a new branch 'RELEASE_3_5'
```

```
In [42]: ! touch random_change.txt
```

```
In [43]: ! git add random_change.txt
```

```
In [44]: ! git commit -m "random change being committed to RELEASE_3_5"
```

```
[RELEASE_3_5 058c2a7] random change being committed to RELEASE_3_5  
1 file changed, 0 insertions(+), 0 deletions(-)  
create mode 100644 random_change.txt
```

```
In [45]: ! git push origin RELEASE_3_5
```

```
Counting objects: 4, done.  
Delta compression using up to 4 threads.  
Compressing objects: 100% (3/3), done.  
Writing objects: 100% (4/4), 589 bytes | 0 bytes/s, done.  
Total 4 (delta 1), reused 0 (delta 0)  
remote: Resolving deltas: 100% (1/1), completed with 1 local object.  
To github.com:nturaga/BiocGenerics  
 * [new branch]      RELEASE_3_5 -> RELEASE_3_5
```

```
In [46]: ! git push upstream RELEASE_3_5
```

```
Counting objects: 3, done.  
Delta compression using up to 4 threads.  
Compressing objects: 100% (2/2), done.  
Writing objects: 100% (3/3), 310 bytes | 0 bytes/s, done.  
Total 3 (delta 1), reused 0 (delta 0)  
To git.bioconductor.org:packages/BiocGenerics  
 eaa81ce..058c2a7  RELEASE_3_5 -> RELEASE_3_5
```

“What we push in life echoes in eternity”

Things a maintainer can NOT do

- Go back in time, i.e, reset to a previous commit and push.
- Push a file > 5 Mb in size.
- Push to a branch other than “master” and “RELEASE_X_Y” (most recent release now, is RELEASE_3_5)

Be careful when rewriting history. It may push you to use the dark side of the —force

Problems some users will face

- Merge conflicts
- Abandoning changes and starting over
- Getting their SSH public keys on Bioconductor, www.bit.ly/submit-bioc-ssh-keys

In Soviet Russia, git commits YOU!

Documentation

1. [svn-to-github.md](#) : Create GitHub repository for existing *Bioconductor* repository
2. [push-to-github-gitbioc.md](#) : Push to both GitHub and Bioconductor repositories
3. [pull-from-gitbioc-push-github.md](#) : Pull updates from Bioconductor and push to GitHub
4. [push-to-release-branch.md](#) : Push updates to the release branch (RELEASE_X_Y)
5. [resolve-conflicts.md](#) : Resolve merge conflicts
6. [abandon-changes.md](#) : Abandon changes and start fresh
7. [add-collaborators.md](#) : Add collaborators and leverage GitHub features
8. [new-package-workflow.md](#) : New package workflow
9. [sync-existing-github-gitbioc.md](#) : Sync existing Bioconductor and GitHub repositories
10. [bug-fix-in-release-and-devel.md](#) : Bug fix in master and release branches
11. [maintain-without-github.md](#) : Maintaining your package on Bioconductor without a GitHub repo
12. [modify-on-local-repository.md](#) : clone and modify a Bioconductor repository for personal use

Maintainers:
Please submit your SSH keys

www.bit.ly/submit-bioc-ssh-keys

I don't know what an SSH key is:

<https://help.github.com/articles/connecting-to-github-with-ssh>



xkcd:1597

"If that doesn't fix it, git.txt contains the phone number of a friend of mine who understands git. Just wait through a few minutes of 'It's really pretty simple, just think of branches as...' and eventually you'll learn the commands that will fix everything."

Rich-h/git-jokes