

MATH 676

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**Finite element methods in
scientific computing**

Wolfgang Bangerth, Texas A&M University

Lecture 32.8:

Learning to use modern tools, part 5b1:

Version control systems (VCSs)

Using git and github in practice

Github

Github is a hosting service:

- For open source projects
- For other projects (for \$)
- Stores the central repository of projects
- Stores individual people's "forks"
- Facilitates the movement of patches (=sets of commits) between repositories

Located at *<http://www.github.com/>*

Github

Typical workflow: Forking, cloning, checking out



github.com

local filesystem

Github

Typical workflow: Forking, cloning, checking out



fork

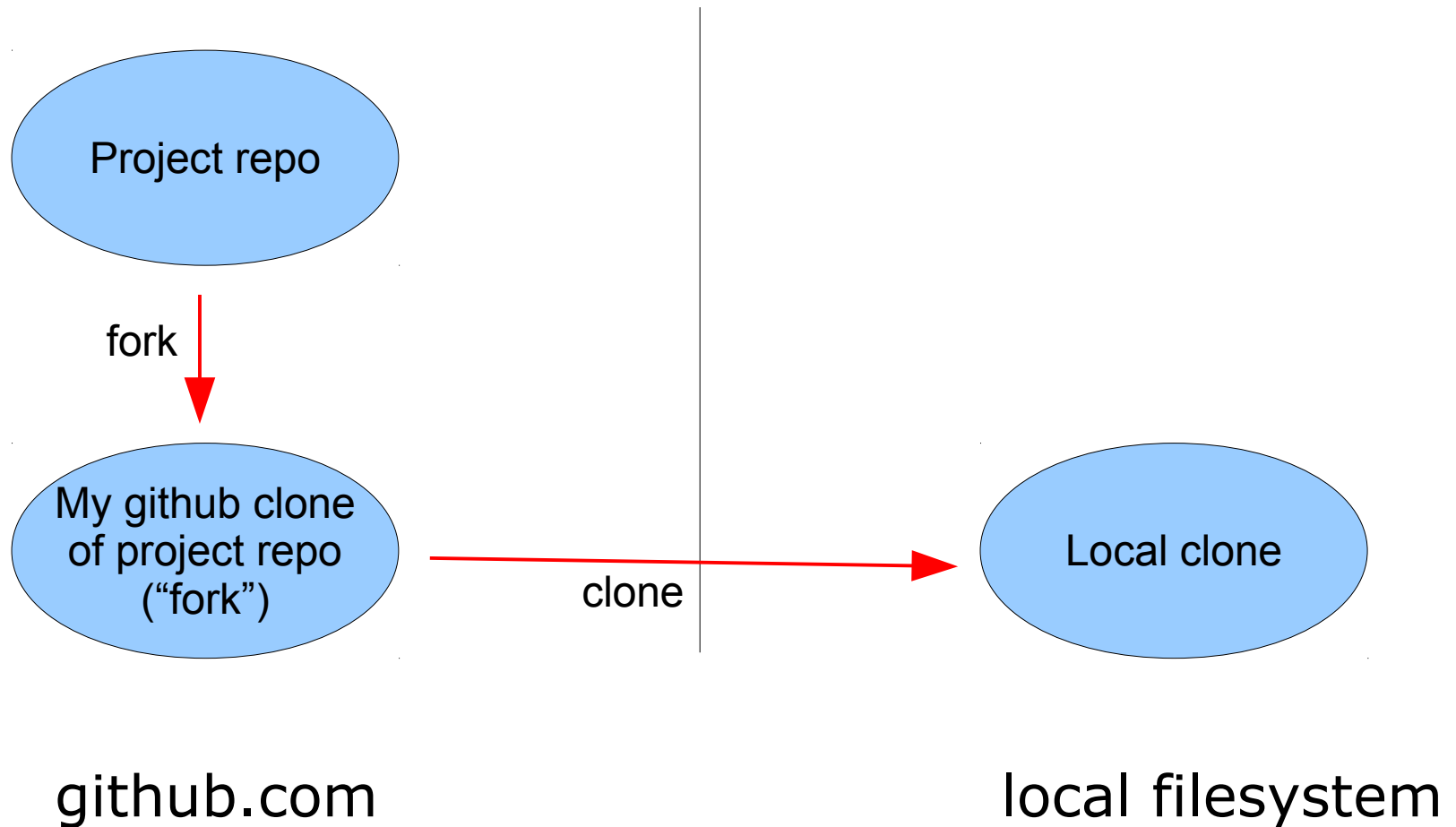


github.com

local filesystem

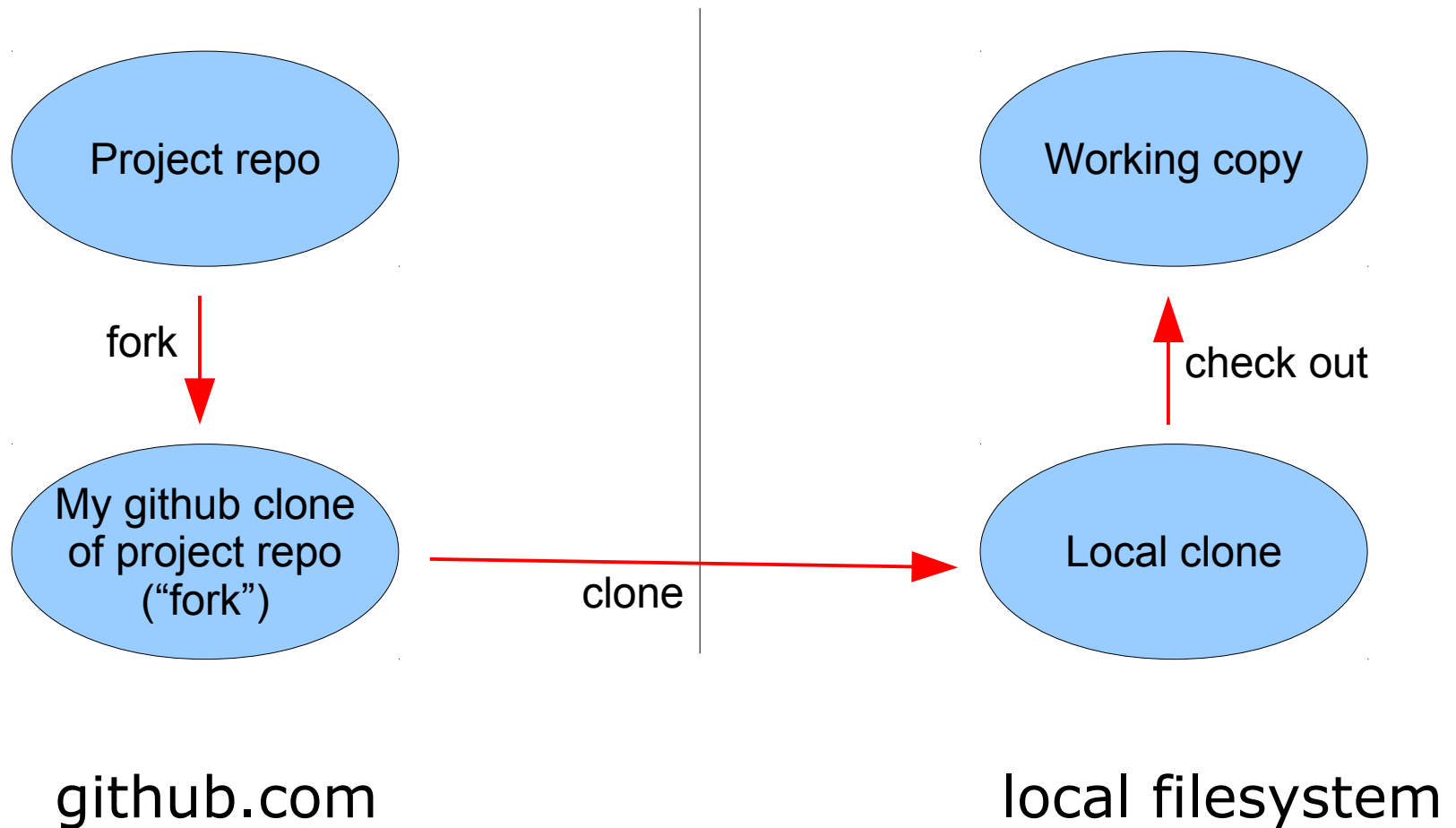
Github

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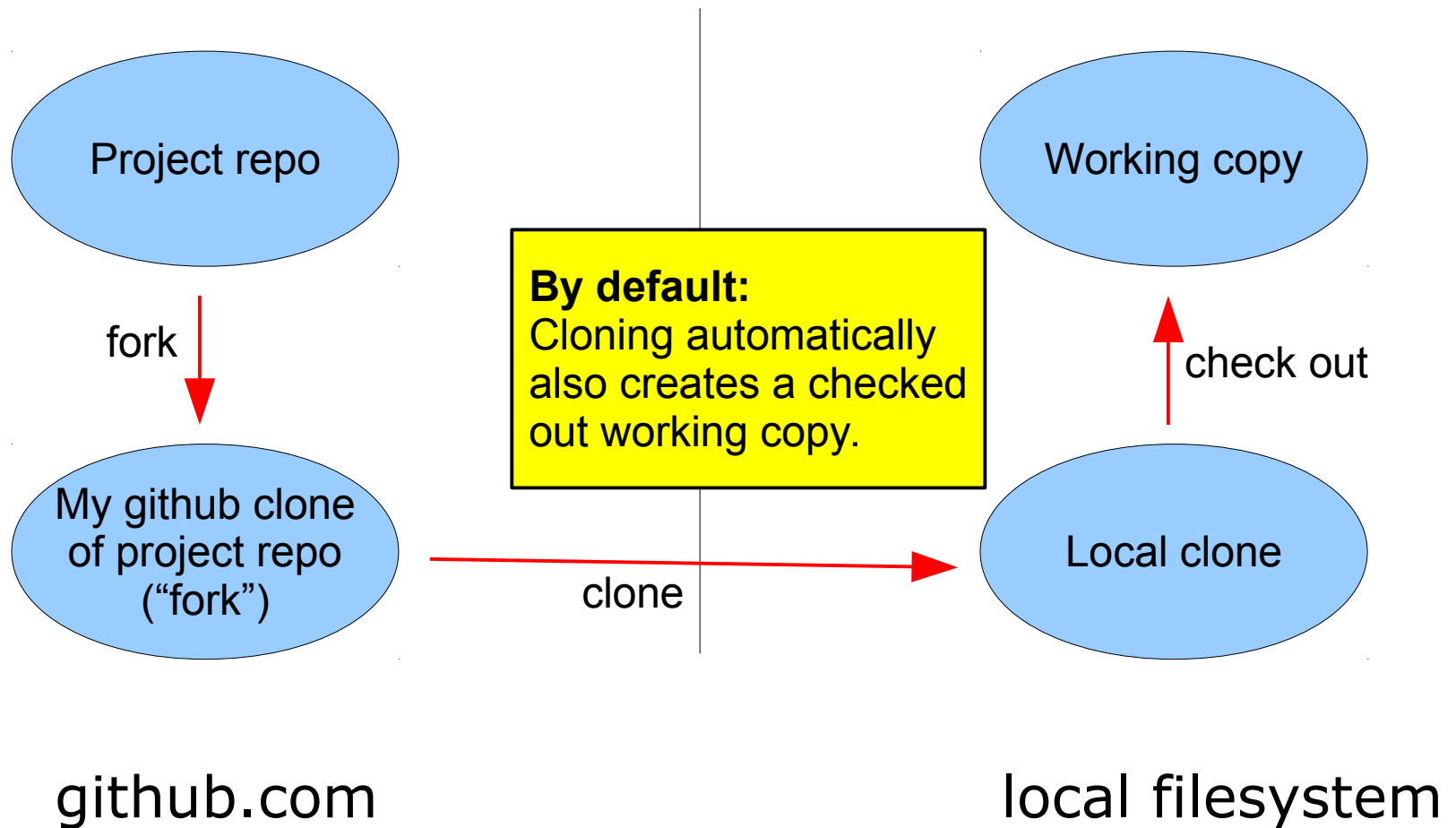
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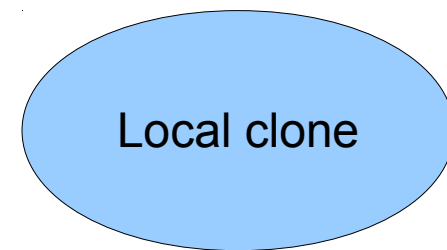
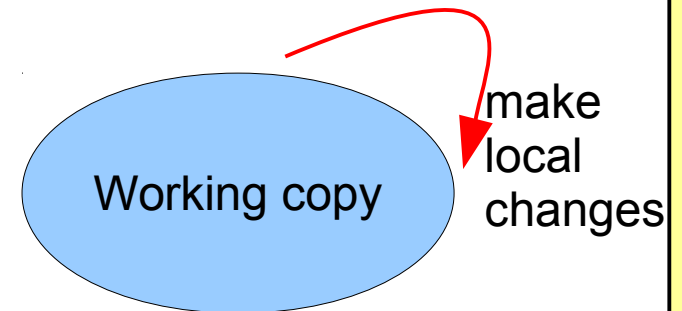


Github

Typical workflow: Making changes, committing, moving them upstream



github.com



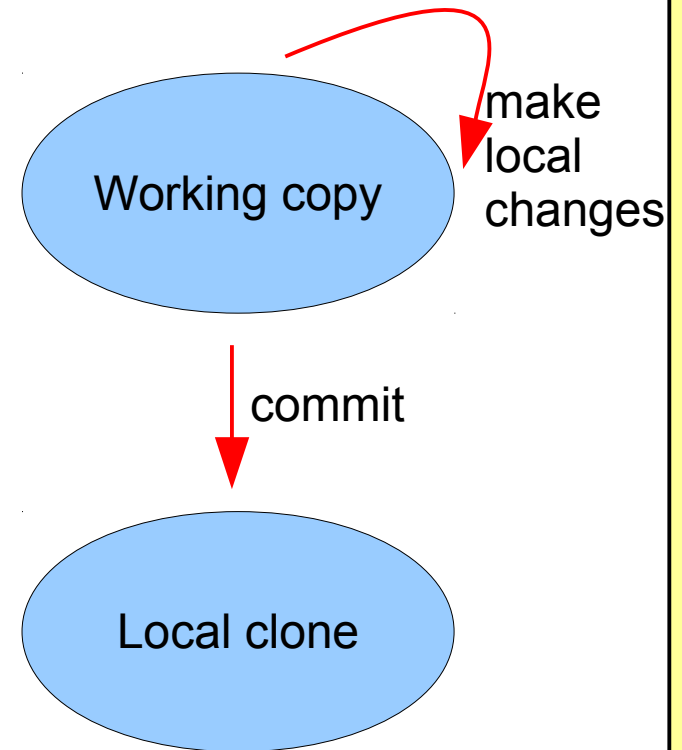
local filesystem

Github

Typical workflow: Making changes, committing, moving them upstream



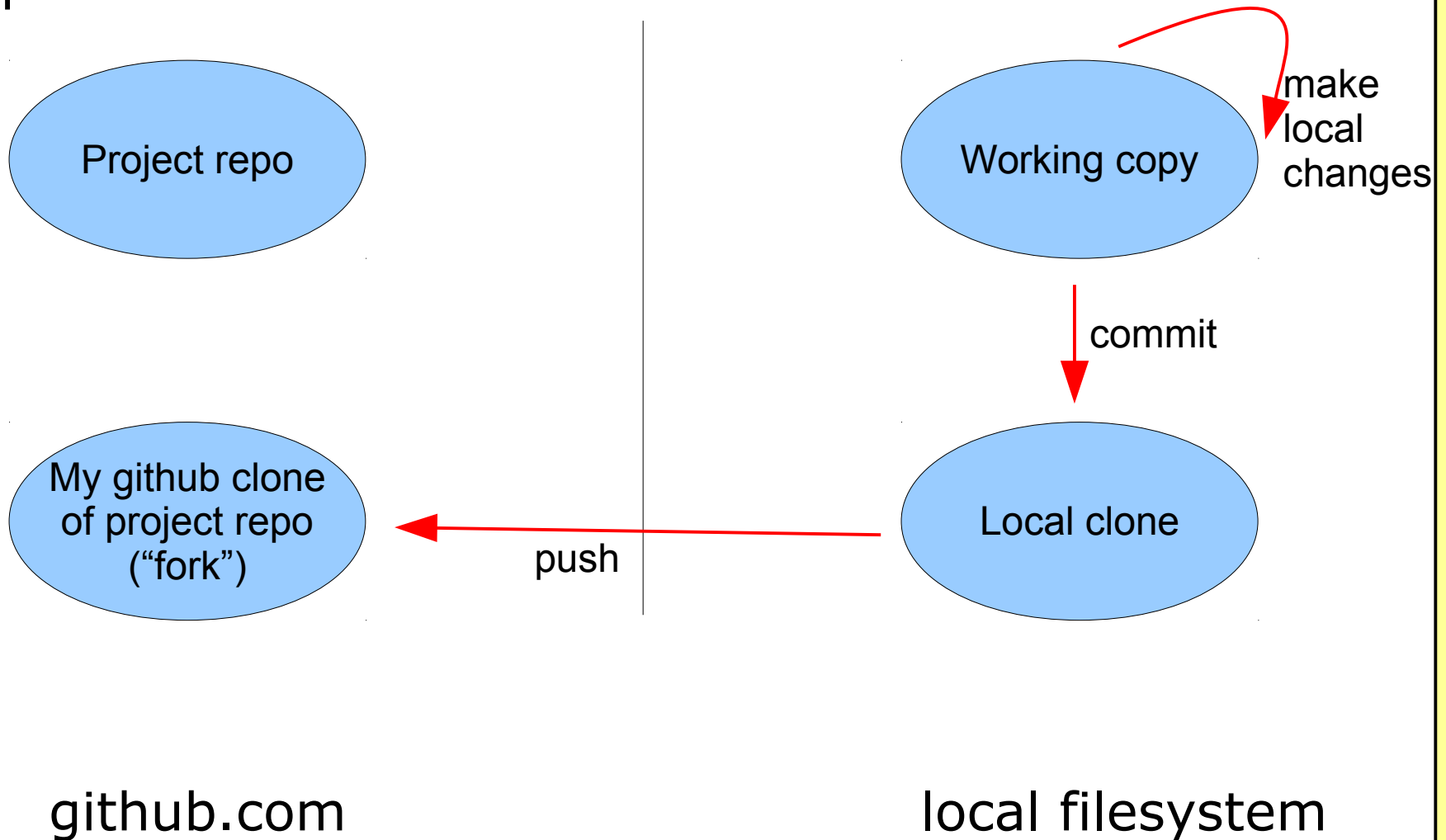
github.com



local filesystem

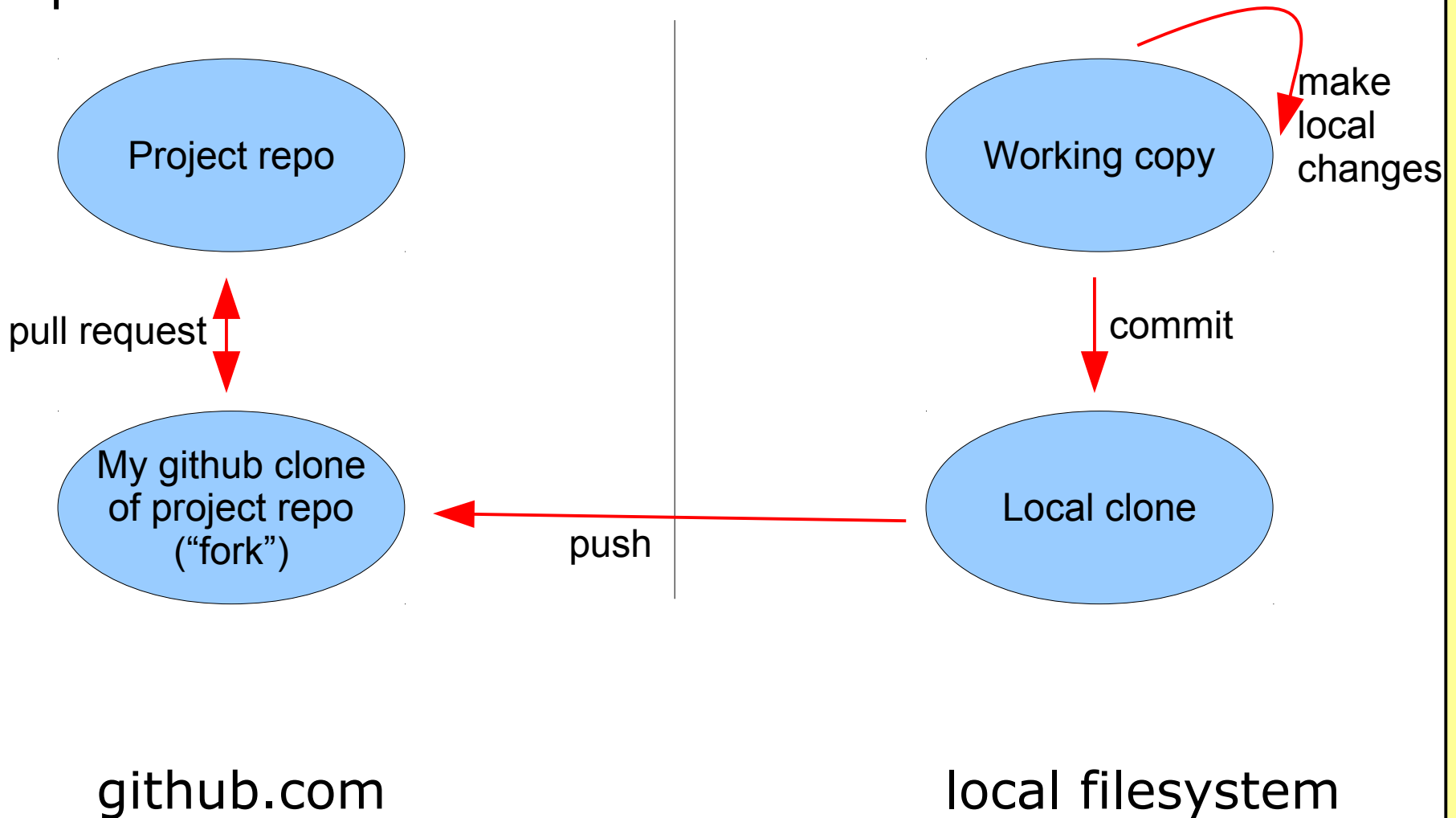
Github

Typical workflow: Making changes, committing, moving them upstream



Github

Typical workflow: Making changes, committing, moving them upstream



Github

In practice:

- Because there is a delay between
 - creating a pull request
 - getting it acceptedit is useful to do almost all development on branches
- Workflow then:
 - create small “feature branch”
 - do development, commit changes
 - “push” the branch
 - create a “pull request” for the changes between
 - . the base of the branch
 - . the tip of the branch

Let's see this in real life!

Github

Notes:

- If you have write-access to the central repository,
 - you could directly clone from there
 - you could directly push there
- But this is a bad idea:
 - it is too easy to accidentally commit something
 - pull requests invite code review → better code quality

Github

Git and github facilitate workflows for software development:

- Allow decentralized software development:
 - everyone has their own forks/clones
 - everyone can control what code flows upstream
 - project developers can control what flows into the central repository
- More complicated than the “one central repository” approach of Subversion
- Experience shows that it works better in “real” practice

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