What is a Code Repository?

- A place to store your code
  - Possibly on your computer, possibly not… but definitely versioned
- A place to *show* your code, and work with others.

what About Actually Laying out the Code?

- There's not an easy answer for science code - it tends to develop "organically".
- Often it's best just to split files when they get too big.
- Always keep the novice user (or future you) in mind… Use descriptive names.
- ***Think modular!***

What About Packaging Code?

- Deliver your code in some form that others can install without thinking too hard about where anything goes.
  - Makefiles, ruby gems, python packages, etc.
  - (Includes sensible versioning!)

What About Packaging Python Code?

Python Packaging Terminology

- "**package**": the biggest thing. E.g., *astropy*, *numpy*, *sunpy*. A directory with an "__init__.py"
- "**module**": a single "something.py" file - the module is "something"
- "**subpackage**": a package within a package
- "**source directory/folder**": the directory/folder with all of a codes "stuff"
- "**repository**"/"**repo**": the source directory *in version control*
- "**submodule**": a git repo embedded in *another* git repo
    - "**astropy-helpers**": an example seen in Astropy packages

Sample Package Layout

```
README
LICENSE
setup.py

mypackage/__init__.py
mypackage/mymodule.py
mypackage/secondmodule.py
mypackage/subpackage/__init__.py
mypackage/subpackage/anothermodule.py
```

```
import mypackage
from mypackage import my module
from mypackage import secondmodule
from mypackage import subpackage
from mypackage.subpackage import anothermodule
```

The goal of packaging and installing is basically to make that work anywhere

Versioning

- In vogue: “semantic versioning”
- x.y.z (E.g., 0.2.3, 2.7.12, 3.6)
  - change *x* for breaking changes
  - change *y* for non-breaking changes
  - change *z* for bug-fixes
- Anything x.y.z<something else> is a pre-release
  - E.g., 1.2.3beta, 2.1.6rc2
- But don’t get too worked up. 0.1 -> 0.2 -> 0.3 is better than nothing.

Licensing Your Code

- Rule #1: Have a license!
- Rule #2: There is no rule #2.

(see problem sets for more)

Go to:
https://github.com/eteq/python-packaging

Get:
PackagingAndRepos.ipynb

(May want to skip to Problem 3)

More Git/Github Background Material

Lets dig down on how you do shared development with public repos using Github.

More Git/Github Background Material

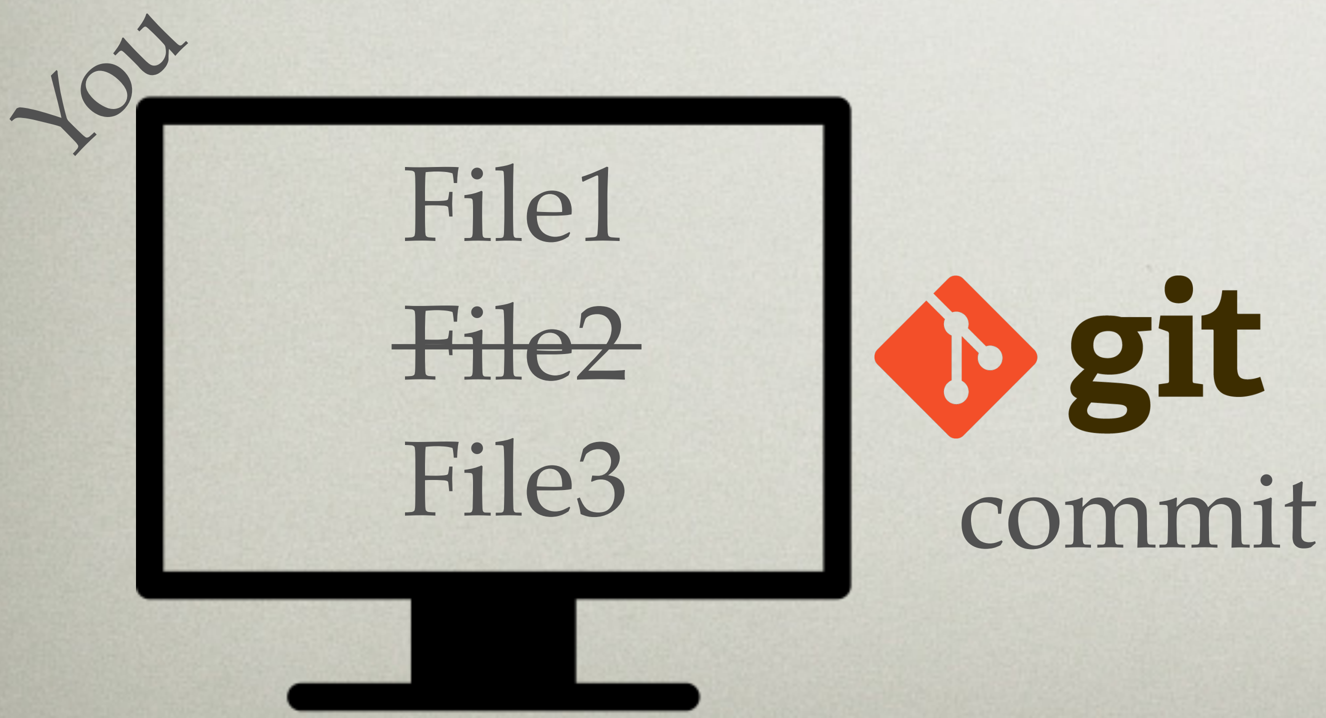
Point to note: git is **not** the same thing as Github. *git* is the software, Github is a web site/service for storing code that you interact with via *git*.

This results in most of the complexity - you need to manage your local copy *and* a Github copy, usually using *git* + the web site itself.

Lets dig down...

You
File1
File2

Lets dig down...



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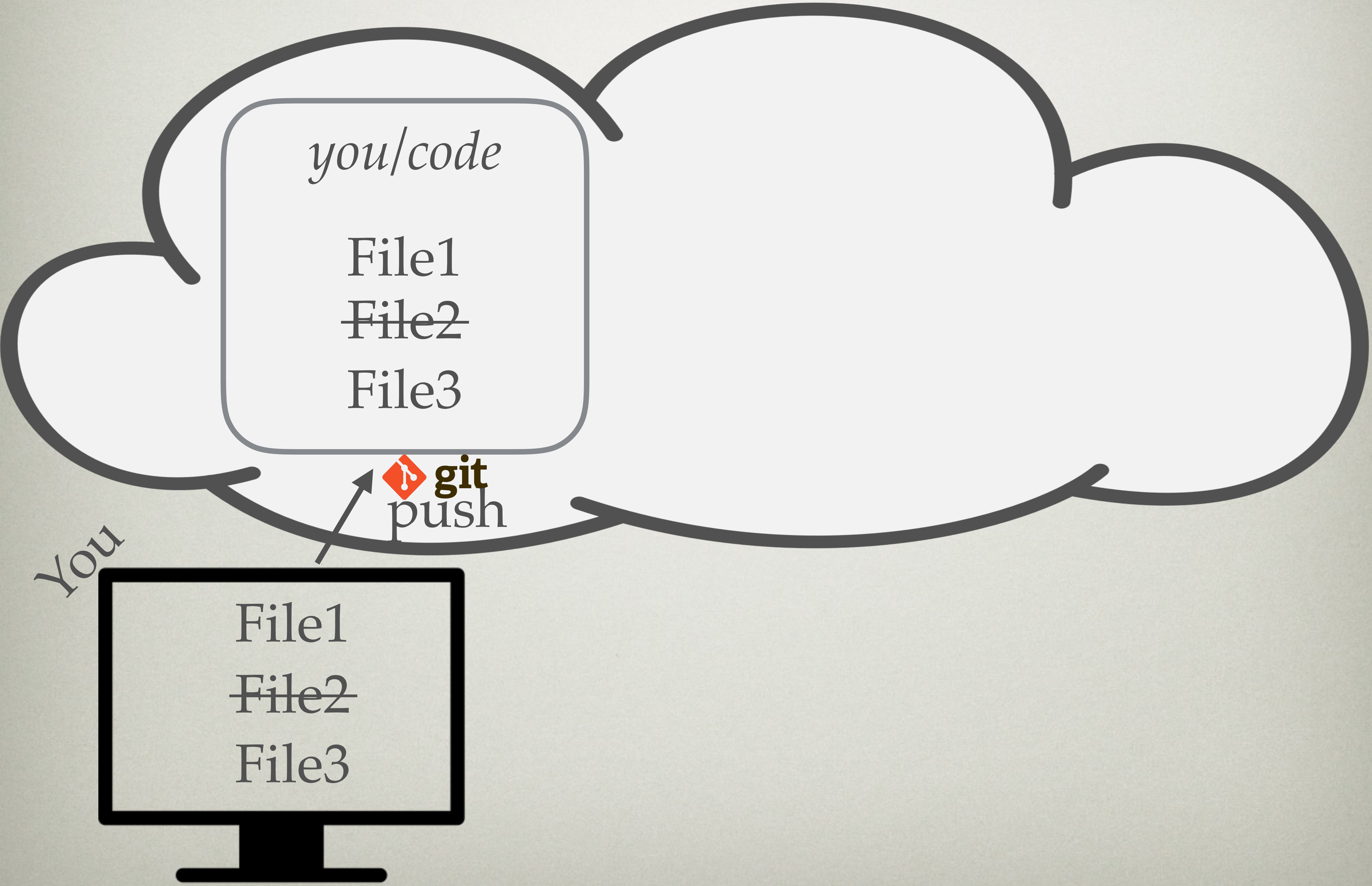

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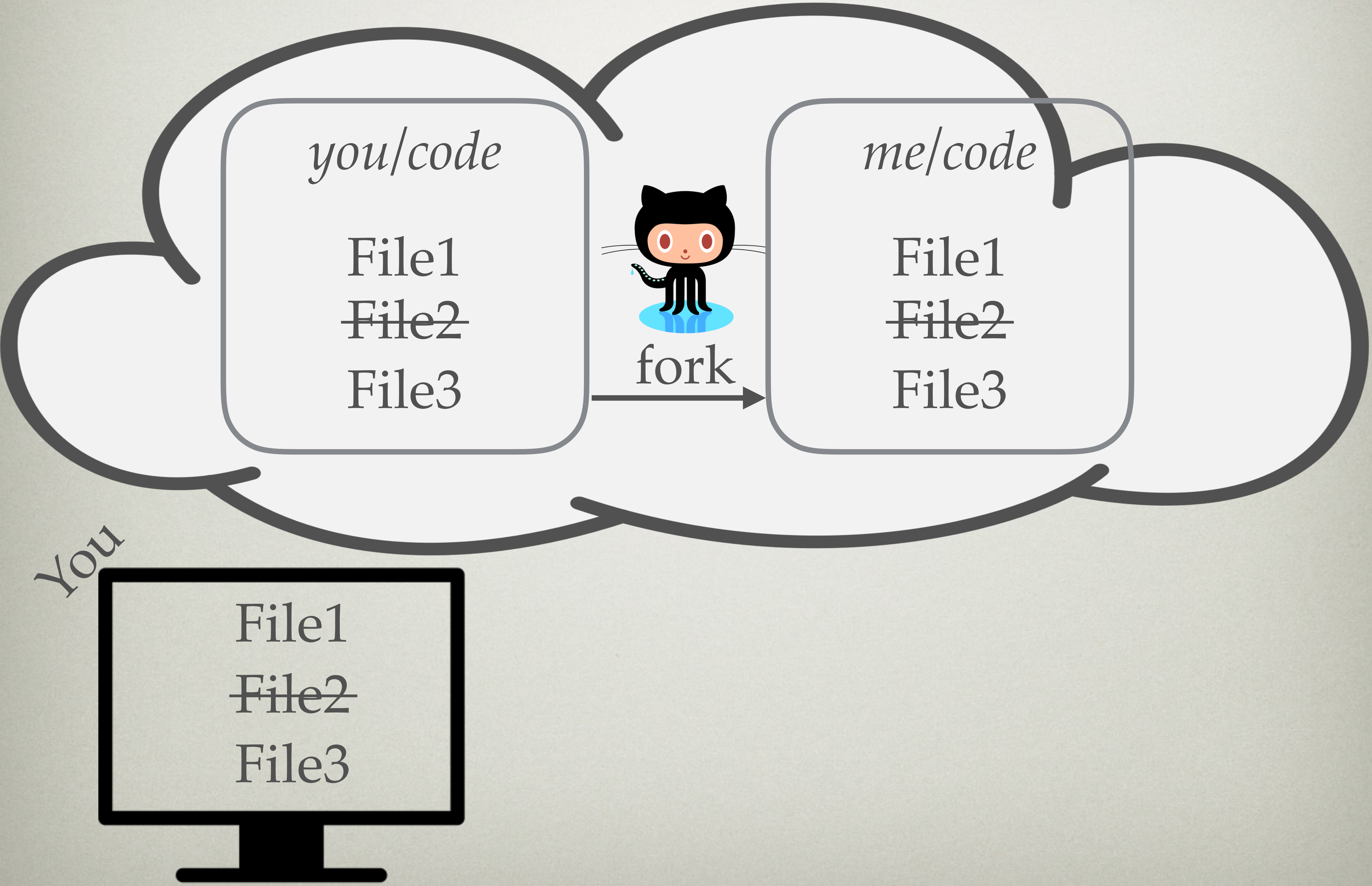

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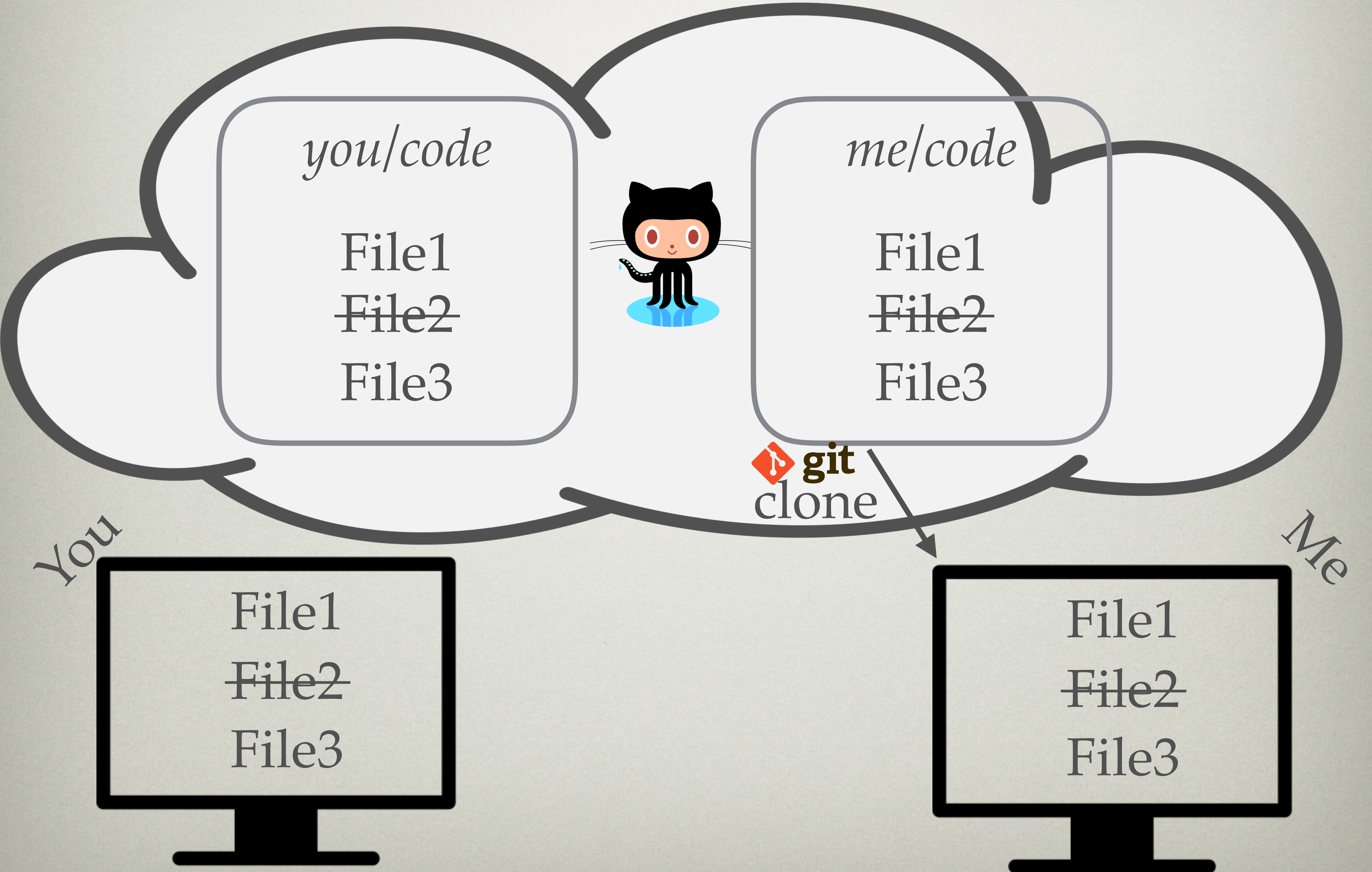

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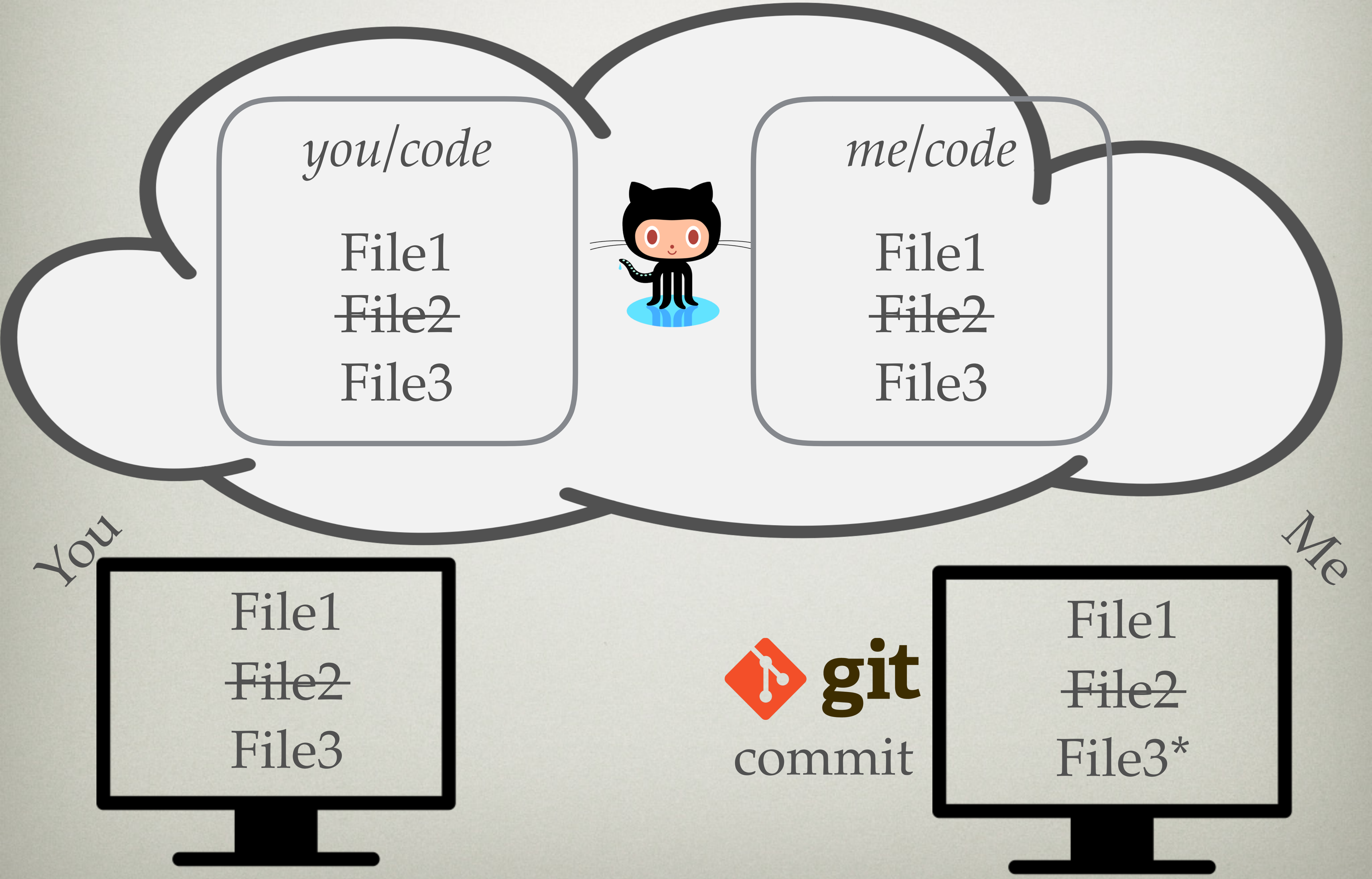

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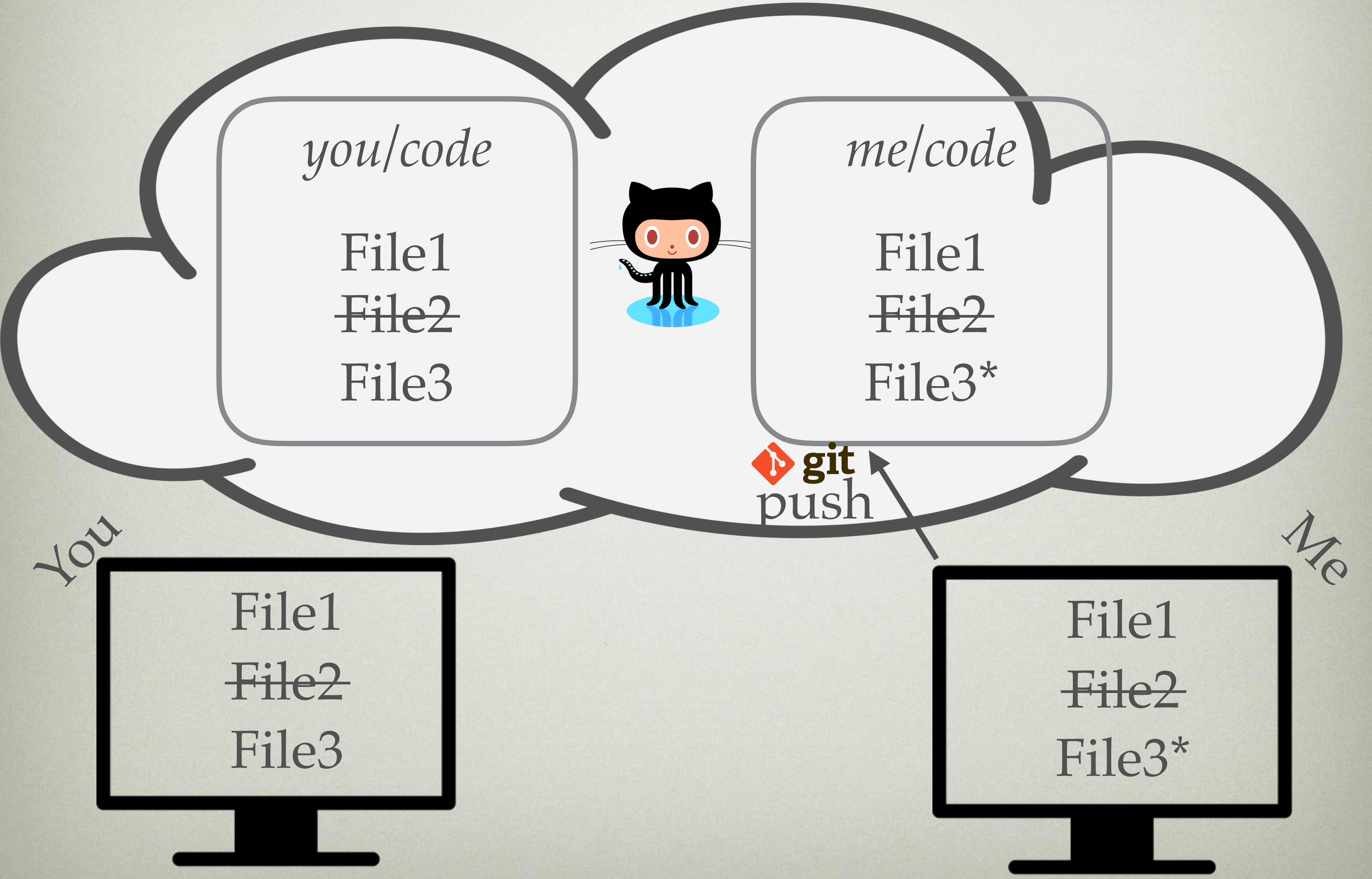

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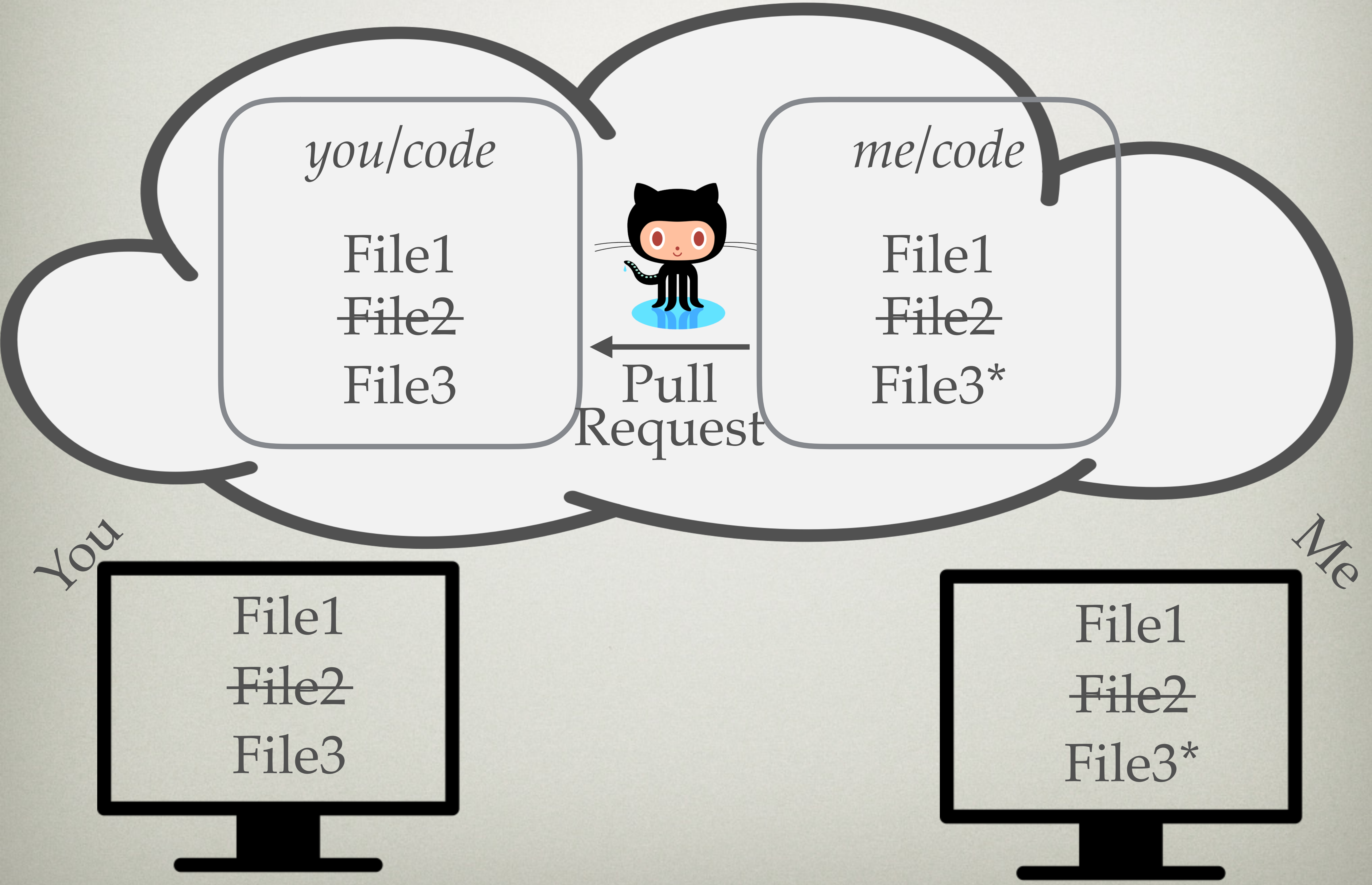

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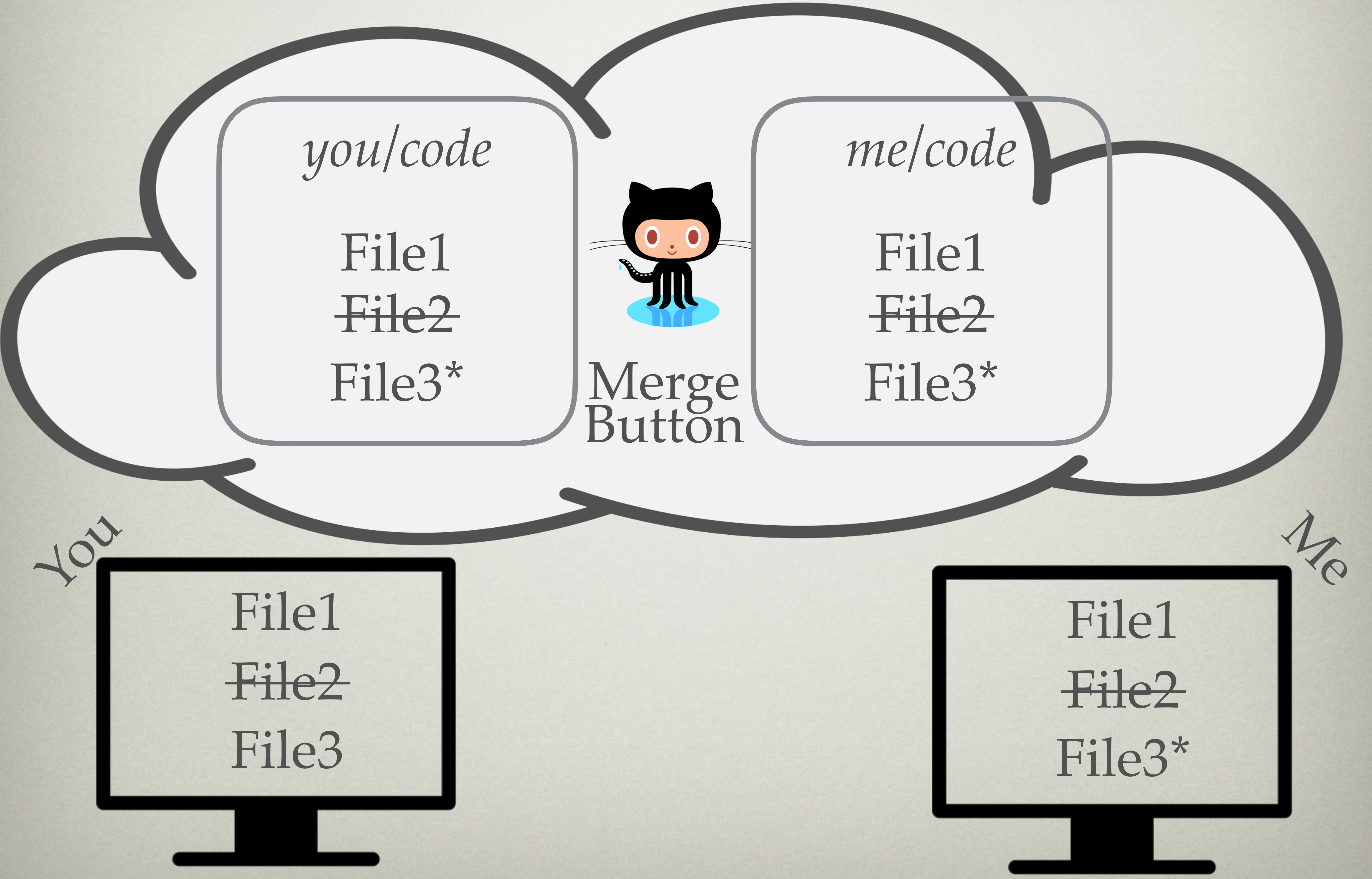

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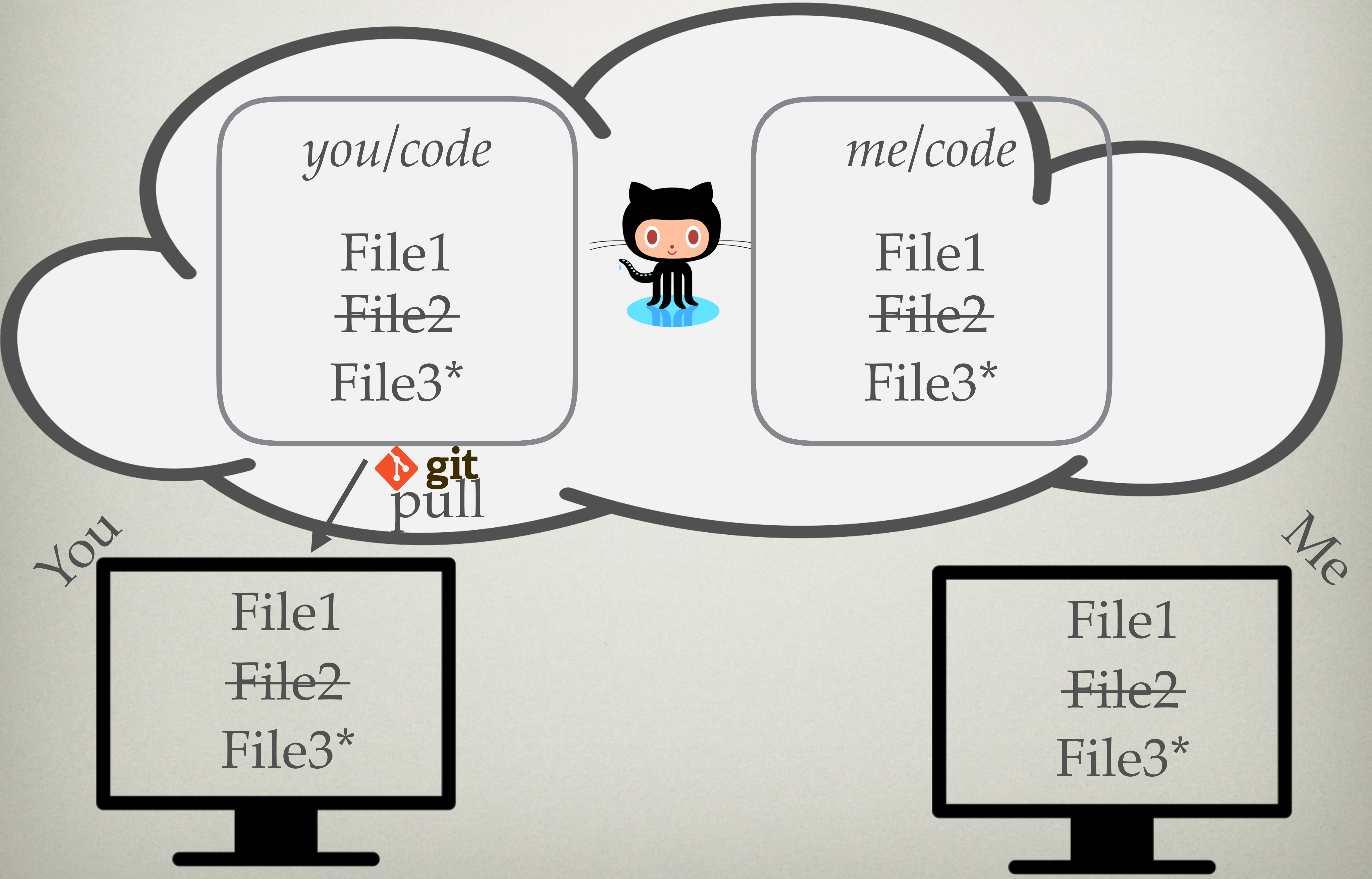

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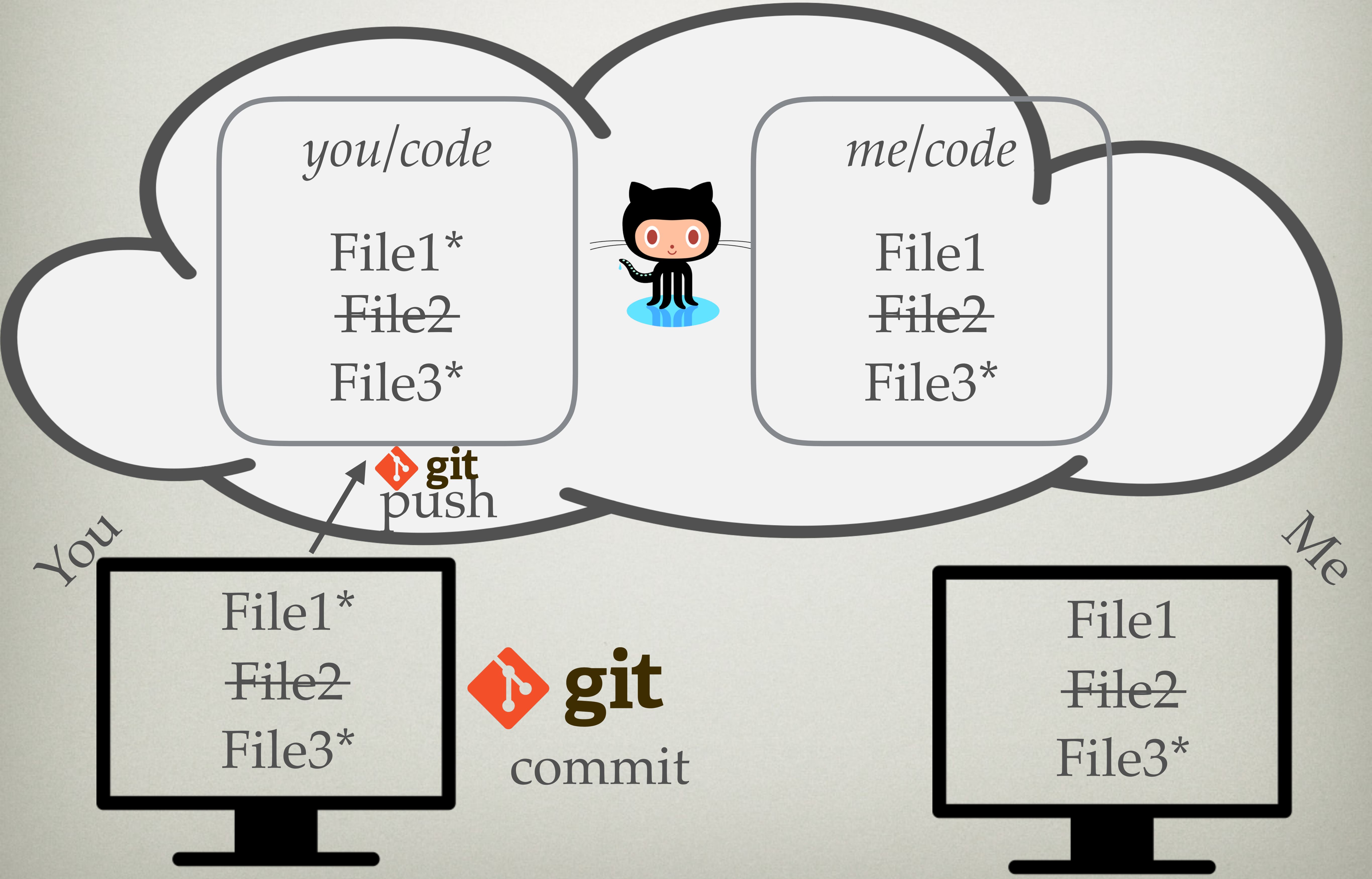

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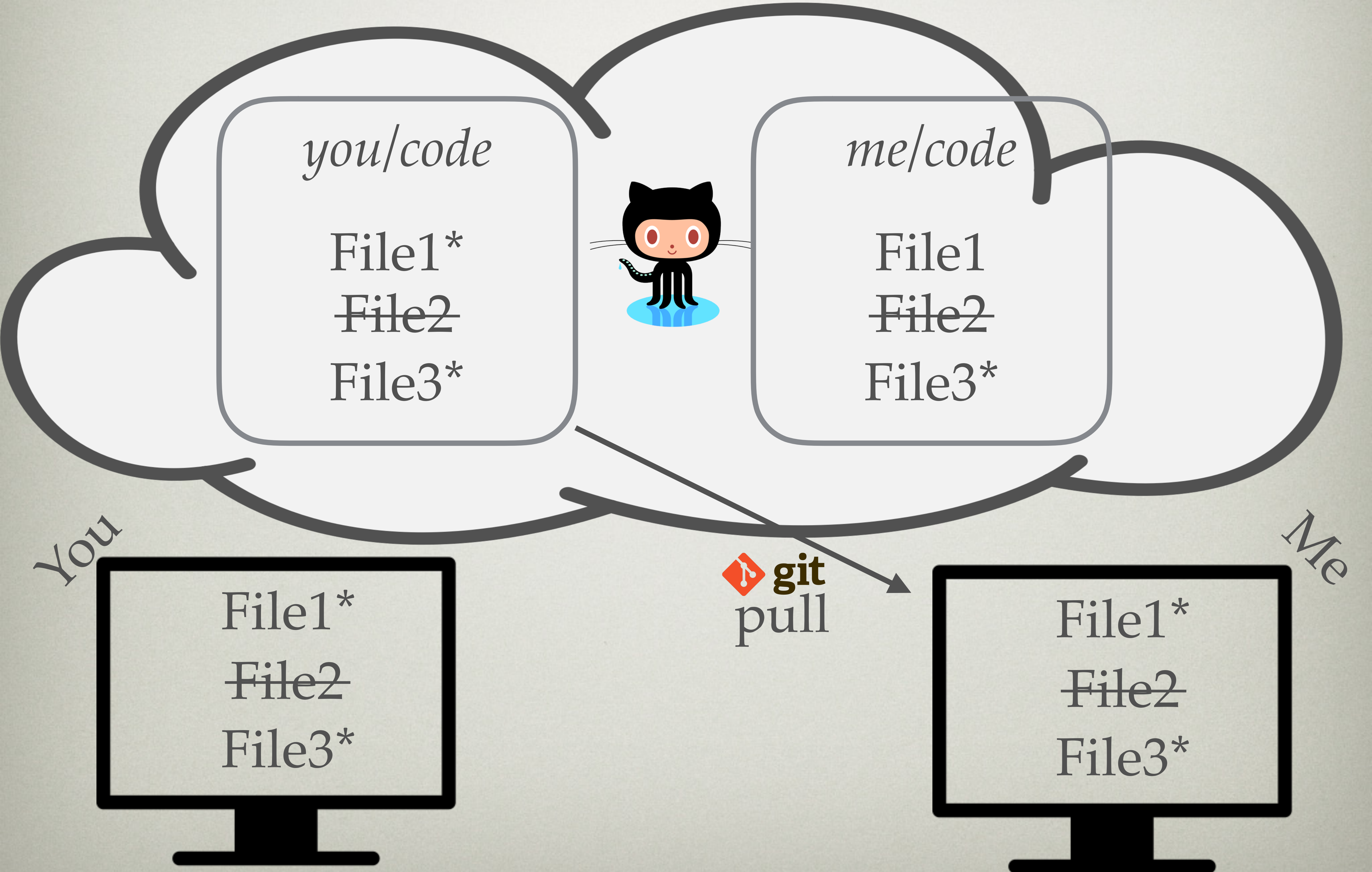
you/code
File1*
~~File2~~
File3*
me/code
File1
~~File2~~
File3*
You
File1*
~~File2~~
File3*
git
pull
Me
File1*
~~File2~~
File3*