Terminal and Environment

CS143: lecture 2

Byron Zhong, June 13

Environment

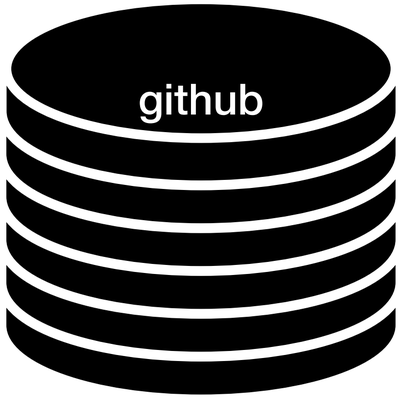
Environment

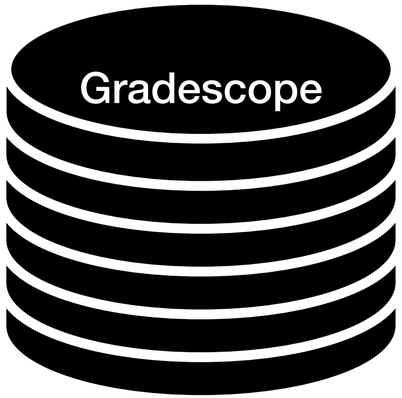
Make it work for you

- You need a text editor — I'm using `vim`
- You need a unix shell/terminal — I'm using Apple's Terminal
- You need a C compiler — Use `clang`, this is not negotiable.
- You need some other libraries — See Resources on the course website
- VSCode + SSH is also a perfectly fine set up
- If you want me to check out your set up, bring it to OH

Environment

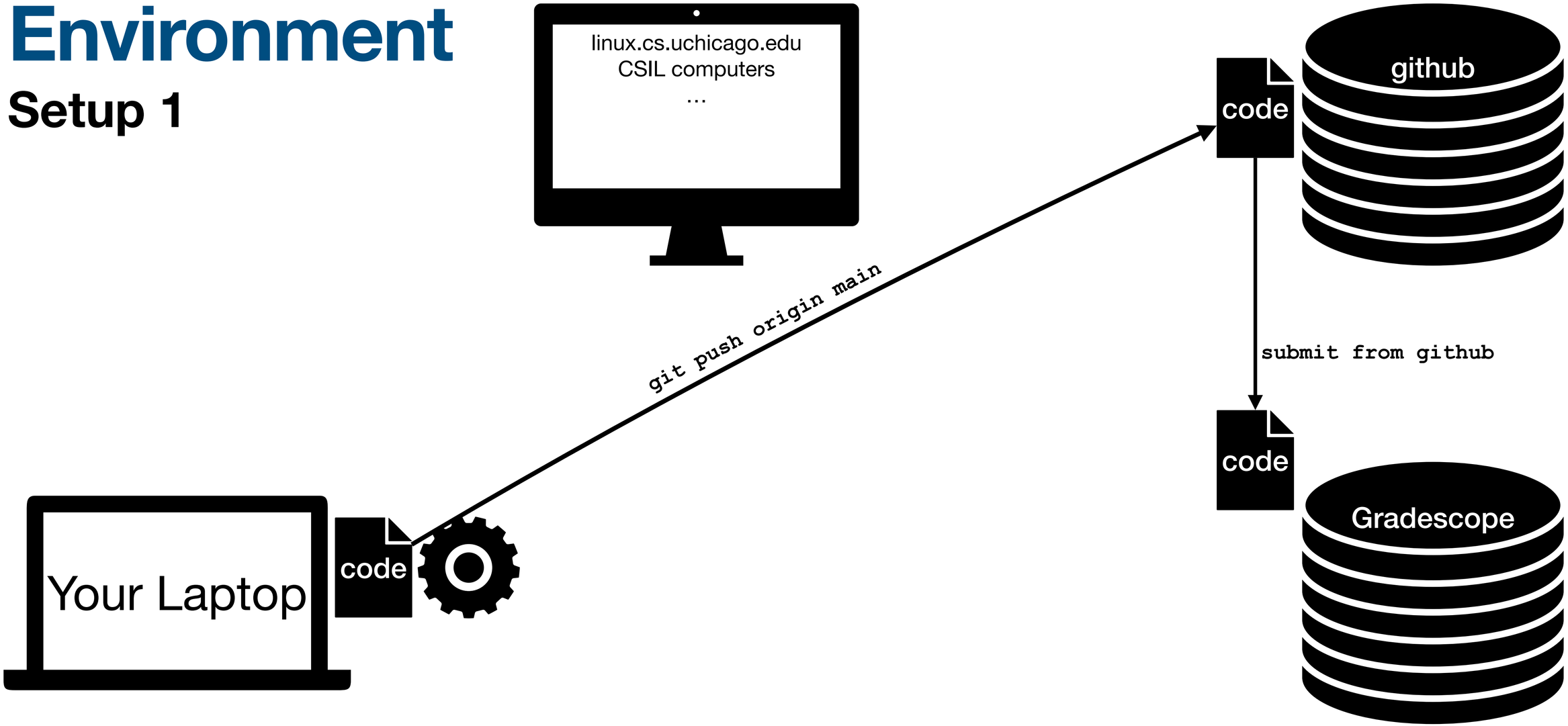
Where do you write code?





Environment

Setup 1



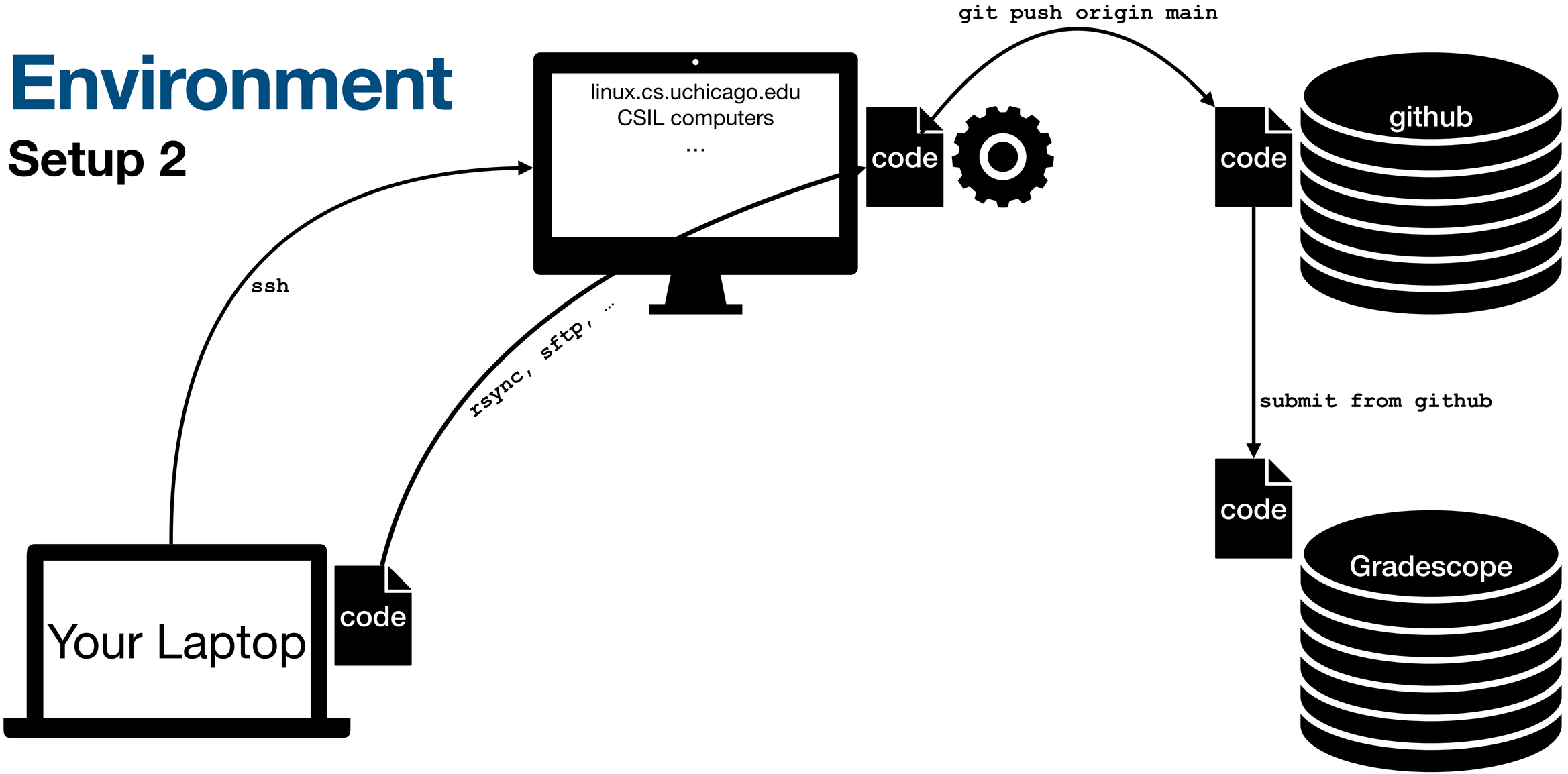
Environment

Setup 1

- Write code locally, run code locally, no department servers involved
- Install all software locally
  - `clang`, `lldb`, `valgrind`, `criterion` library, `imagemagick`
  - Tutorial on resource page
  - Windows users install Windows Subsystem for Linux (WSL)
  - MacOS doesn’t support `valgrind` anymore :((((((((((

Environment

Setup 2



Environment

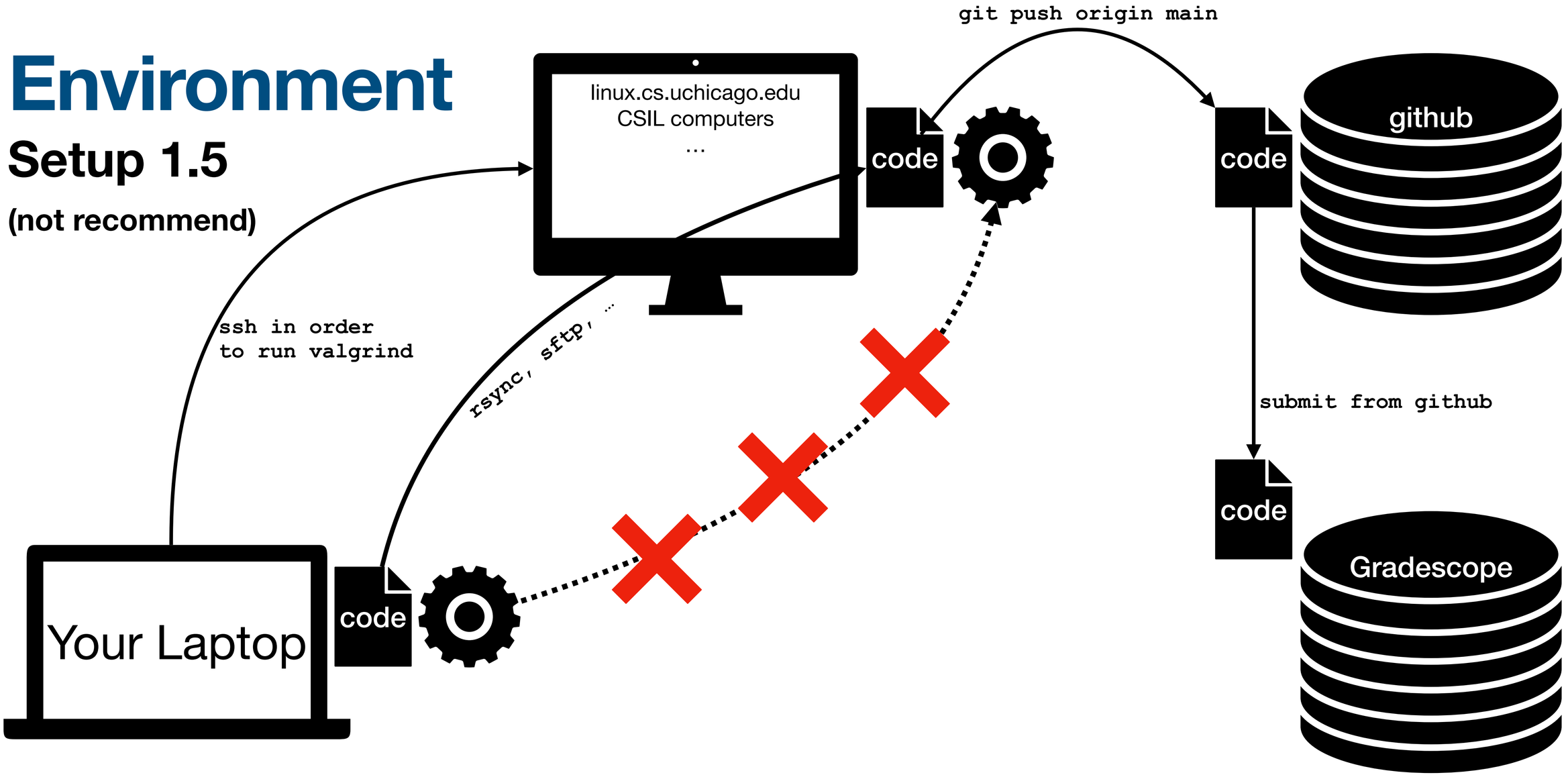
Setup 2

- Write code locally, run code remotely, usually VSCode does it for you
- Don’t need to install anything locally — department server has everything
- Dependent on the server

Environment

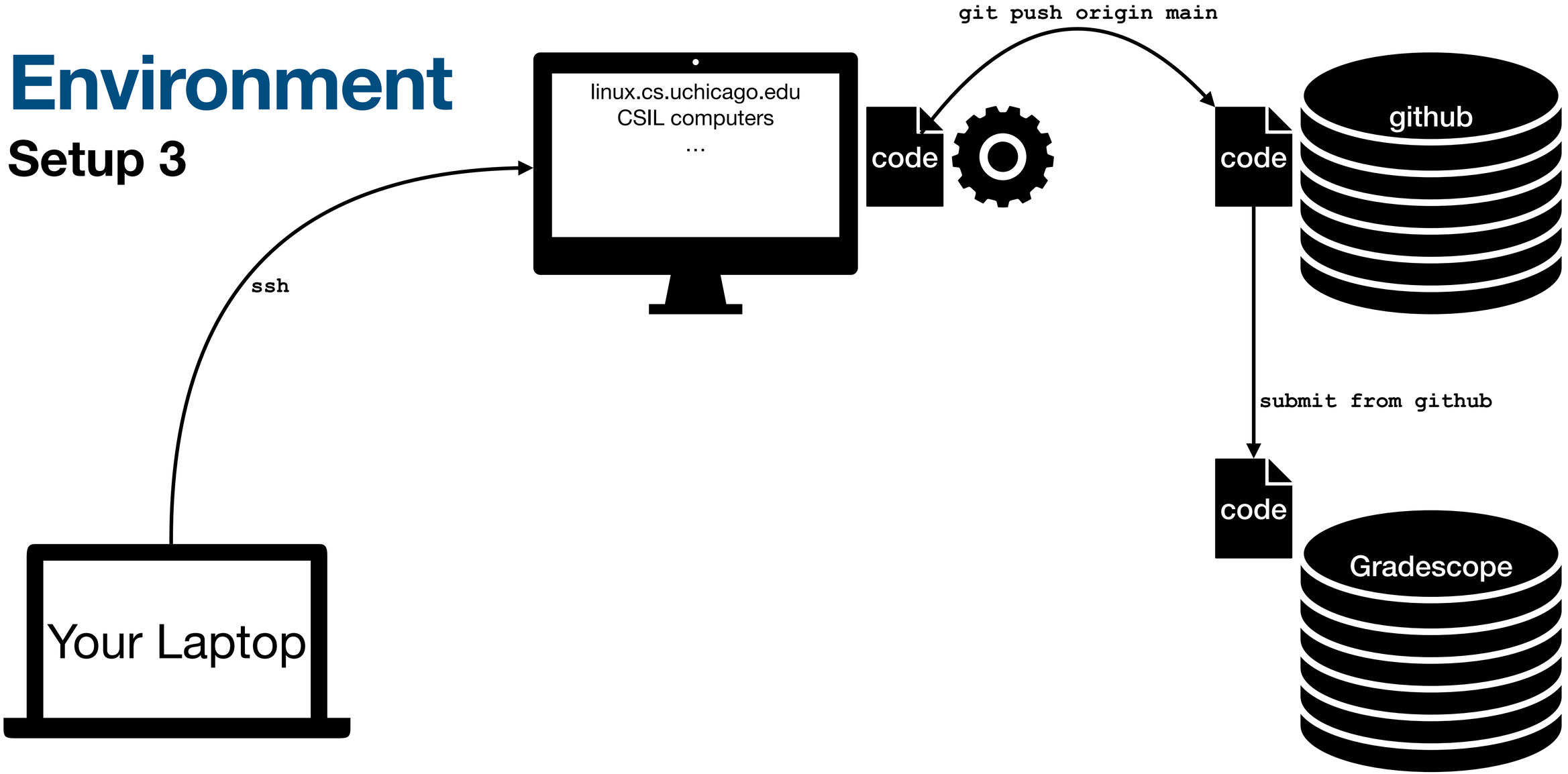
Setup 1.5

(not recommend)



Environment

Setup 3



Environment

Setup 3

- Write code remotely, run code remotely, no laptops involved
- Single point of failure
  - Sync your code often with git

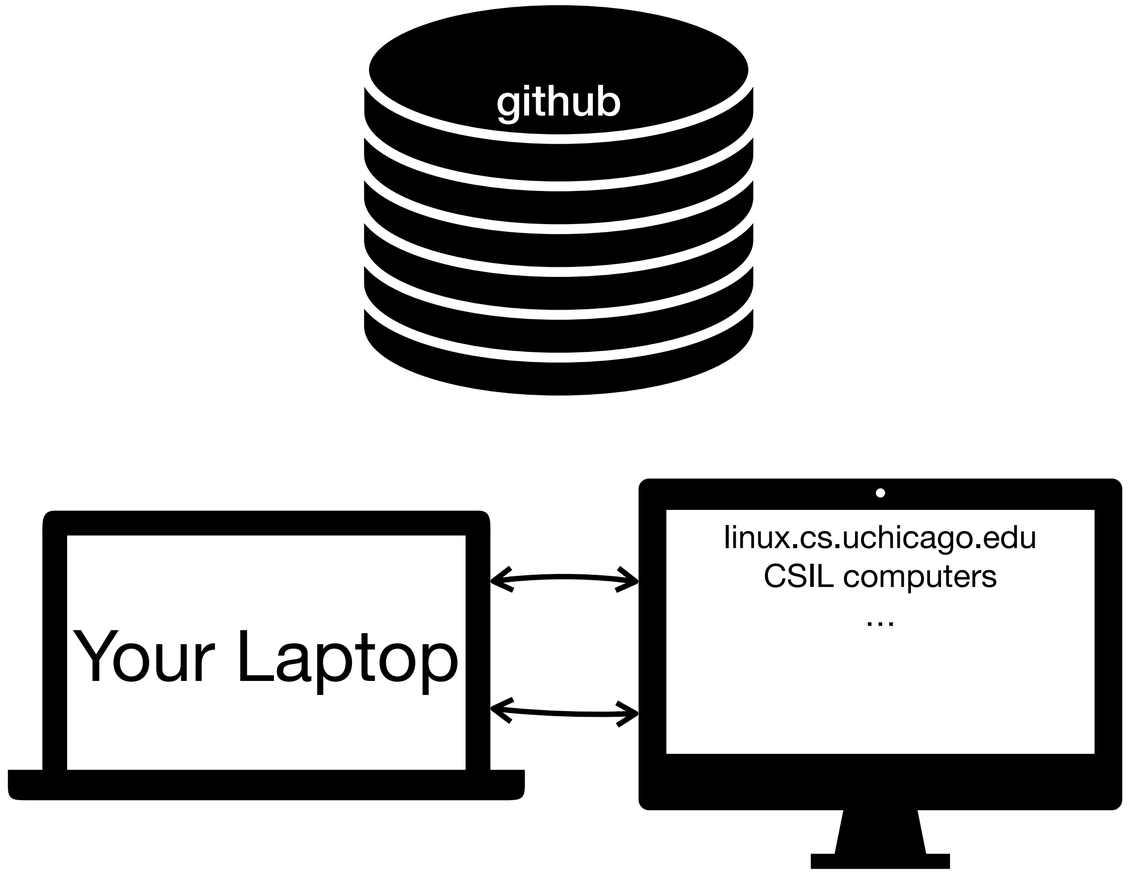
Environment

git

- Git is a version-control system.
- File system stores the current state of a file.
- Git stores all *changes* made to the file — all *versions* of a file.
- A “commit” makes a new version of the file.
- A repository is a list of commits.

Environment

git



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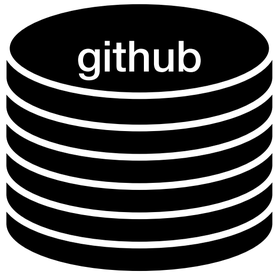

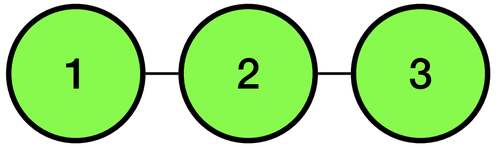

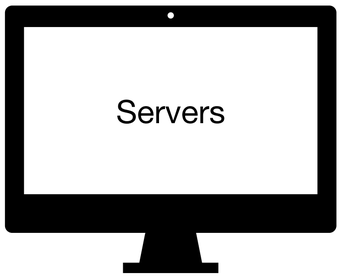

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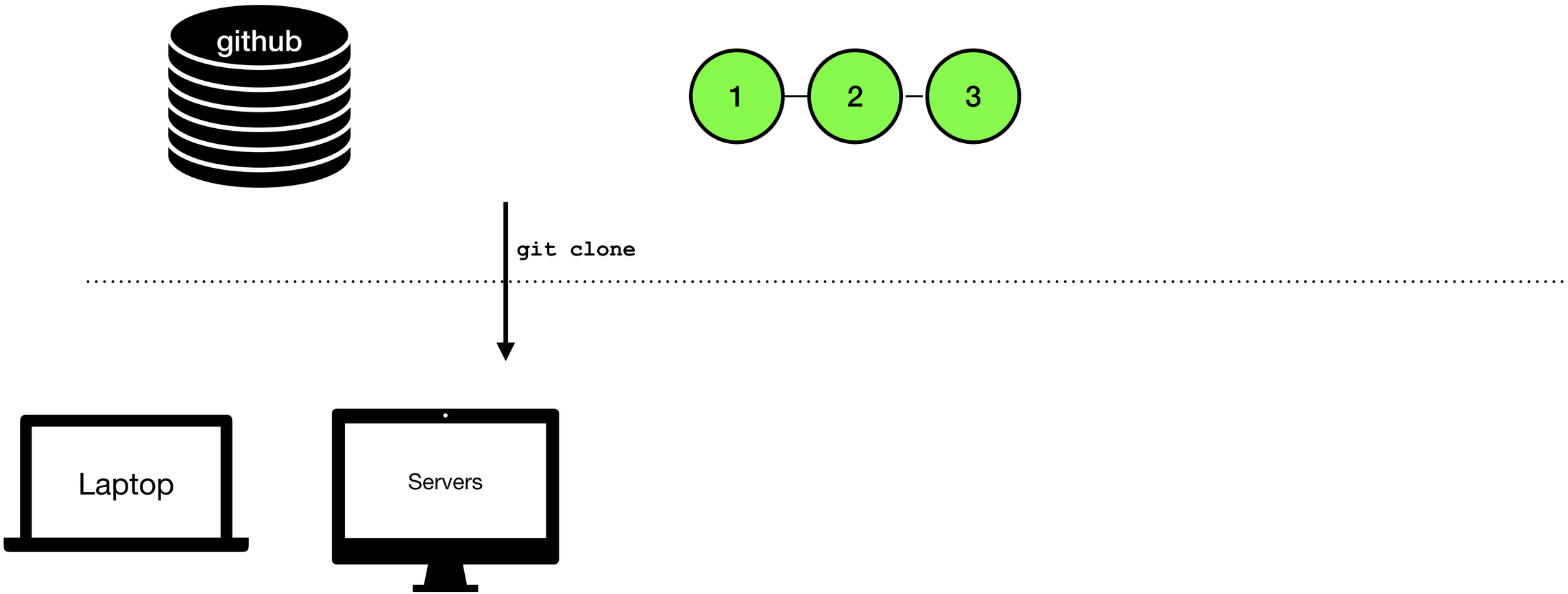

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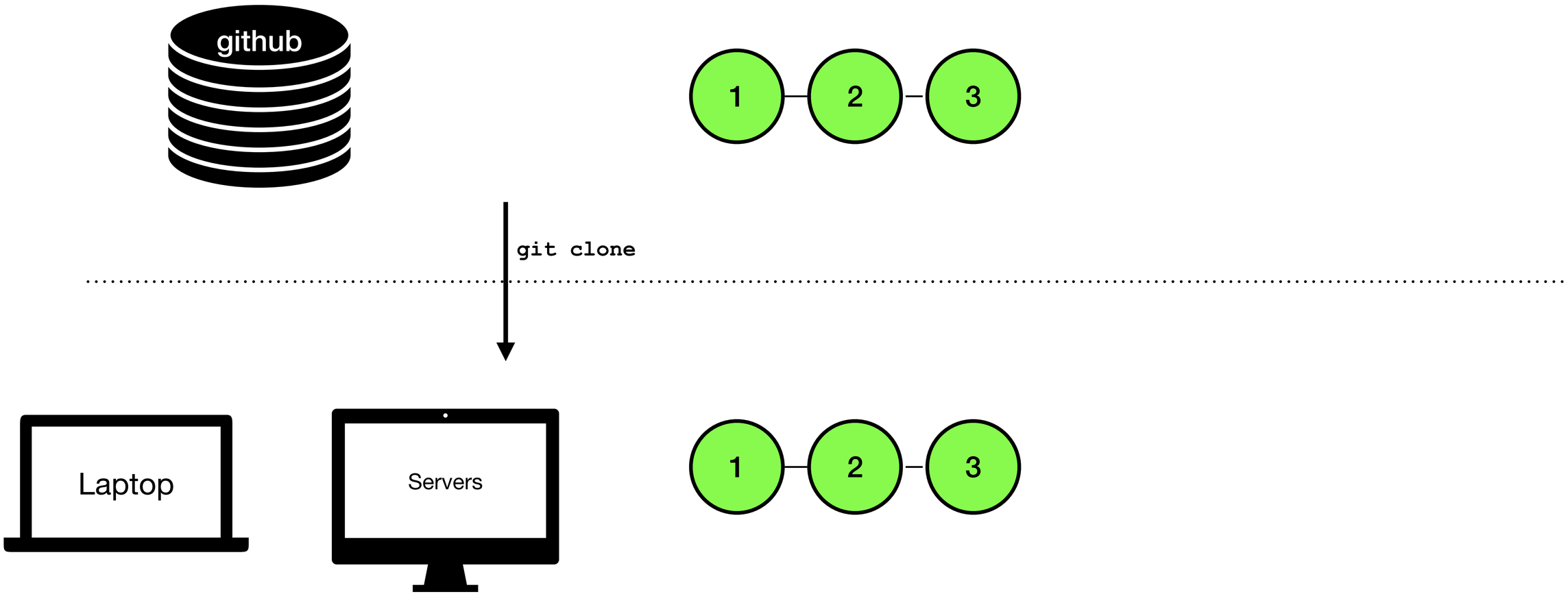

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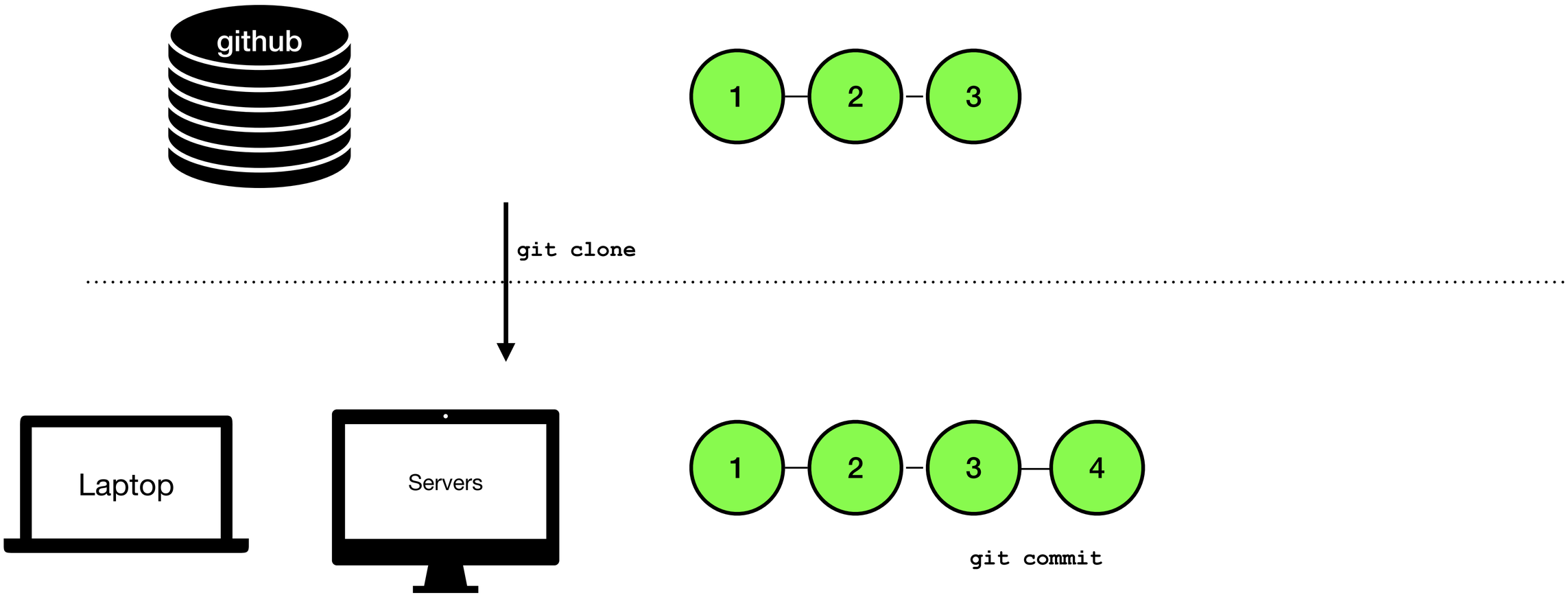

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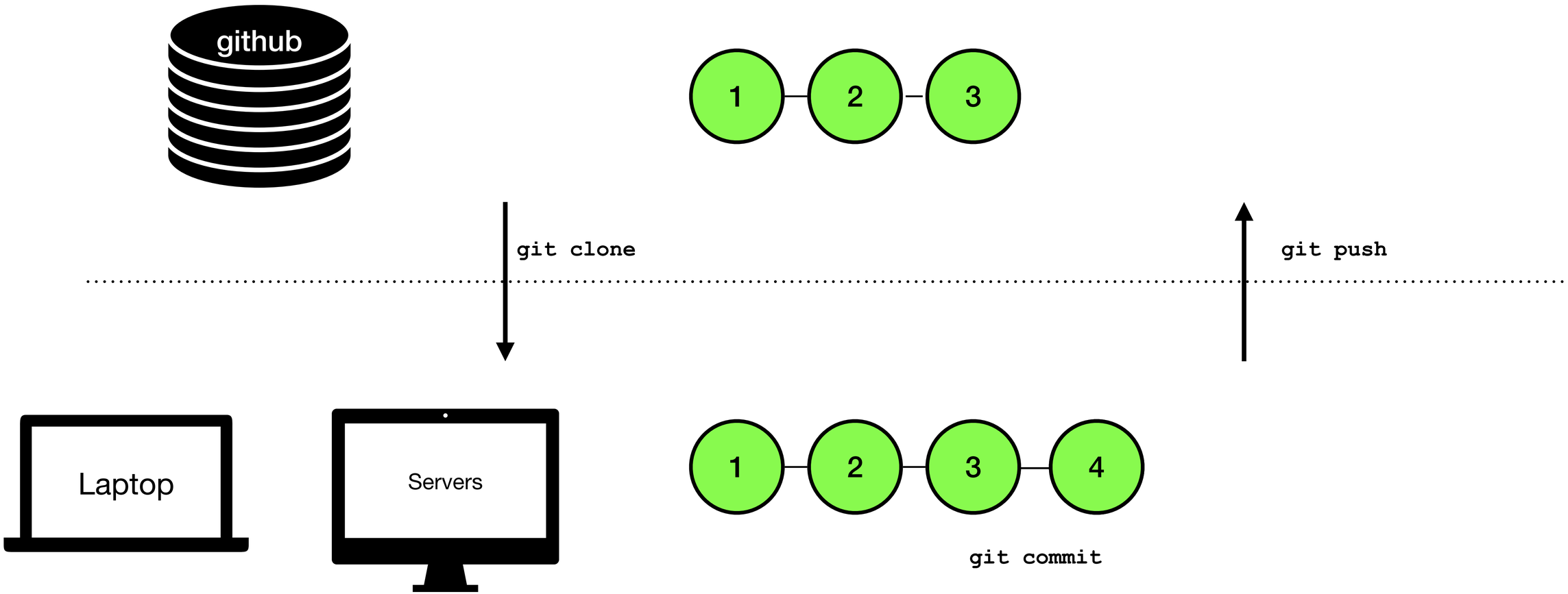

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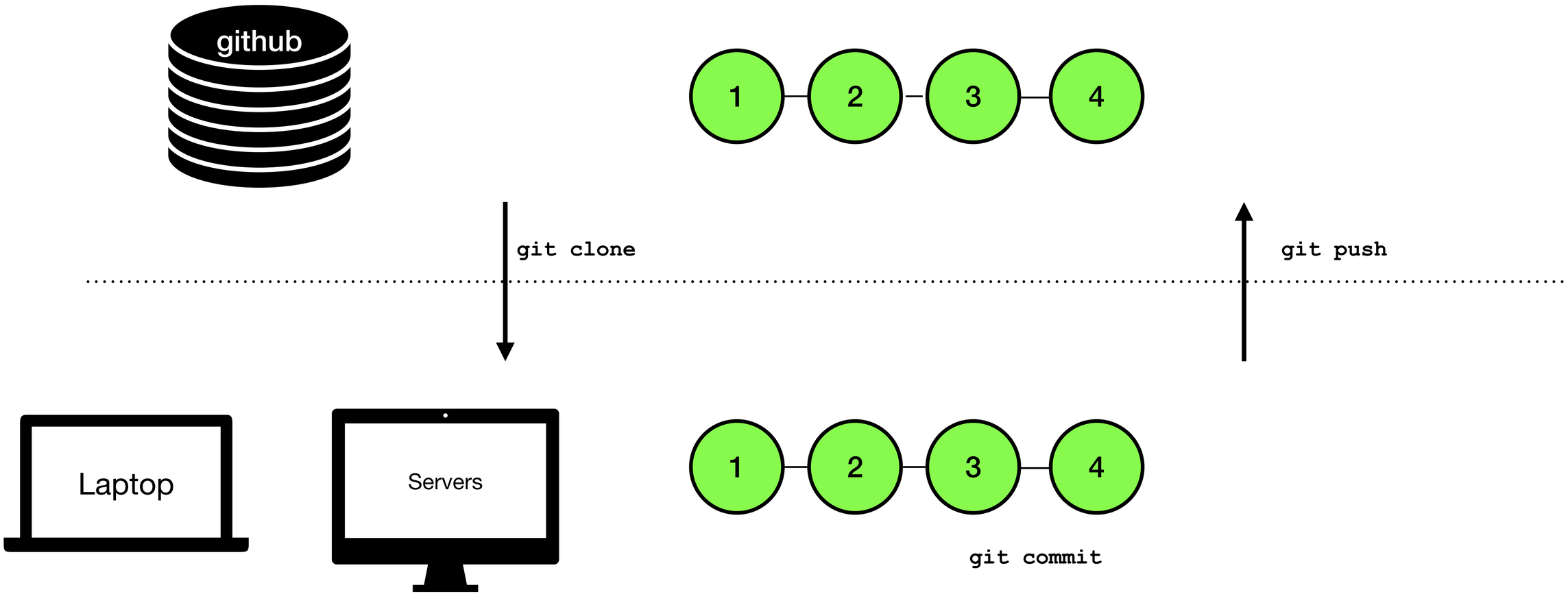

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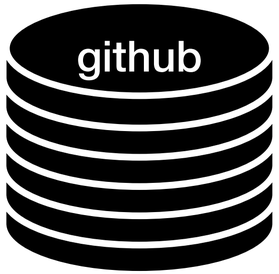

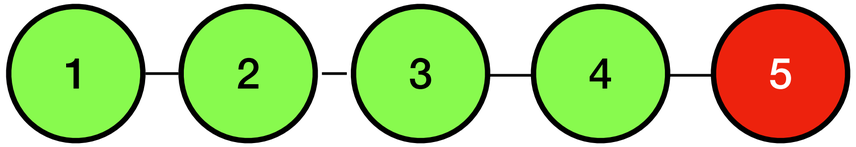

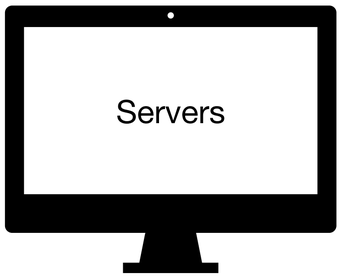

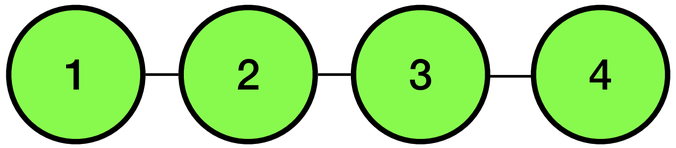

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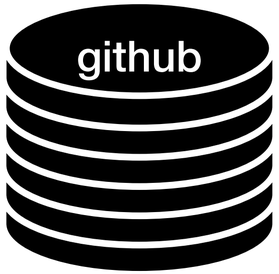

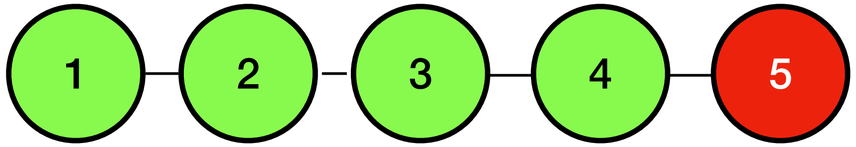

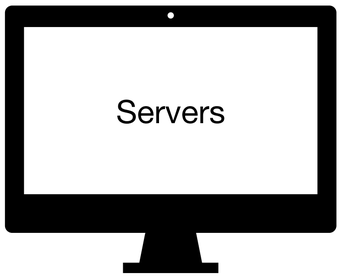

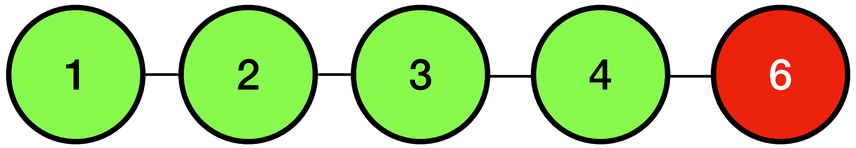

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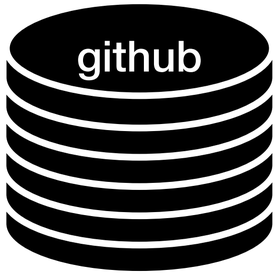
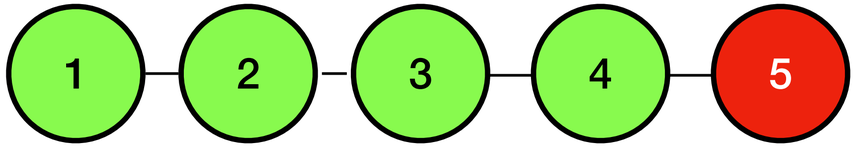
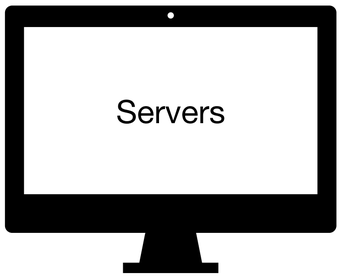
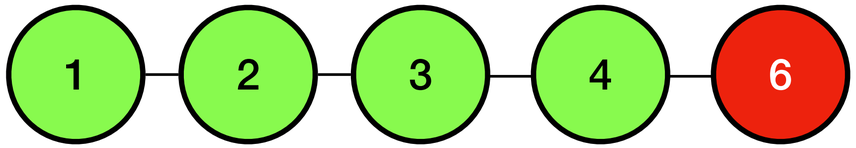




git push





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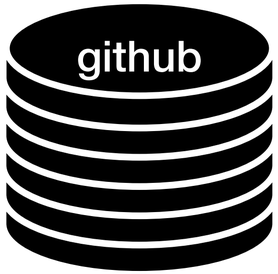

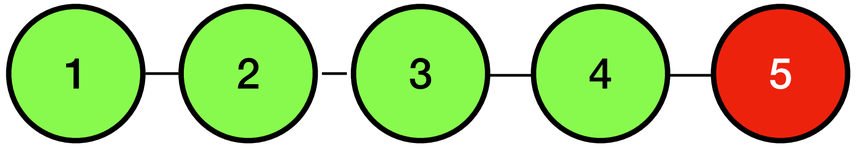

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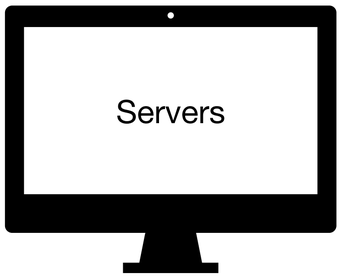
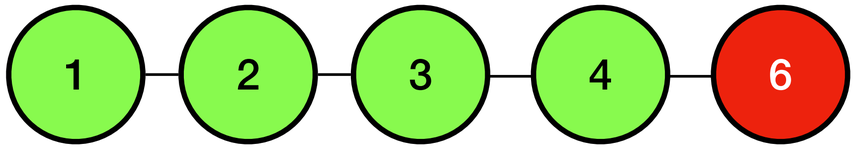
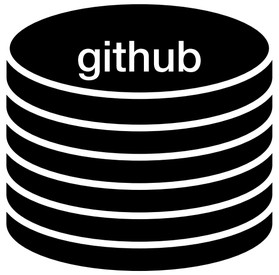


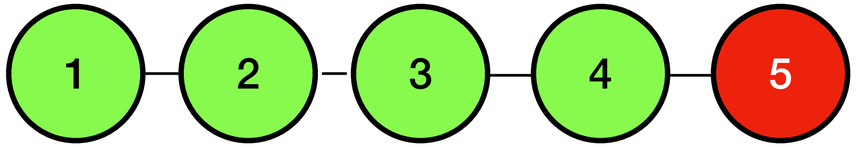


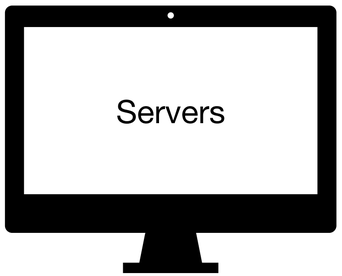
Environment

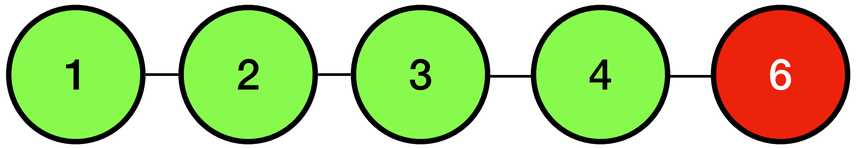
git

```
! [rejected]          master -> master (non-fast-forward)
error: failed to push some refs to 'https://github.com/REDACTED.git'
hint: Updates were rejected because the tip of your current branch is behind
hint: its remote counterpart. Integrate the remote changes (e.g.
hint: 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```









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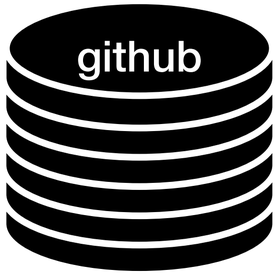

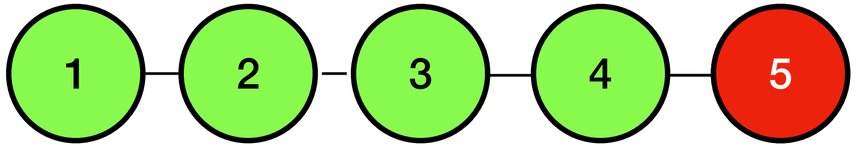

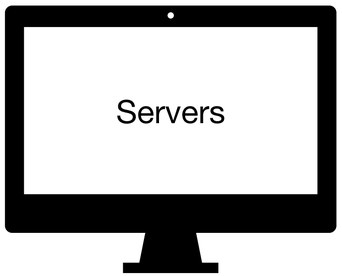

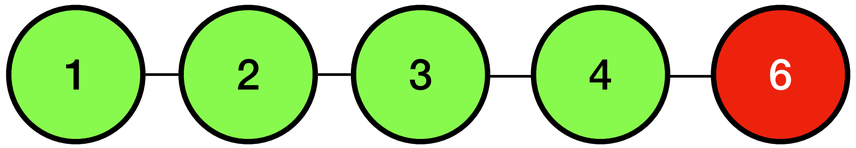

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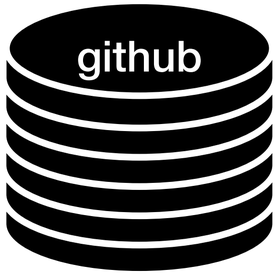

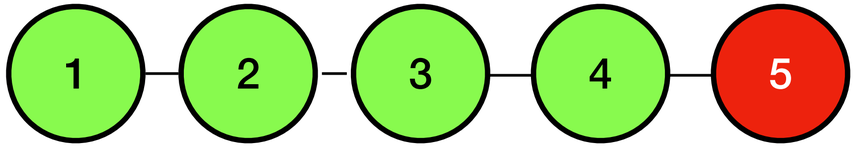

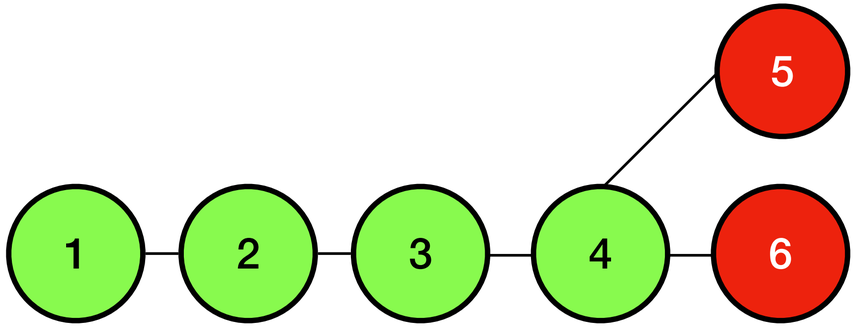

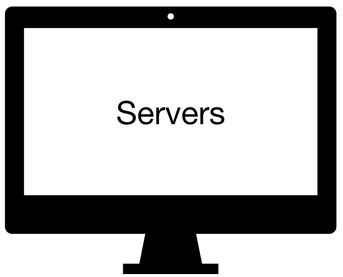

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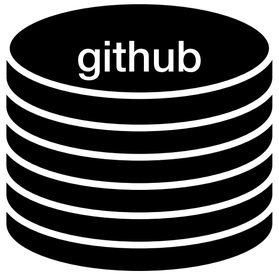

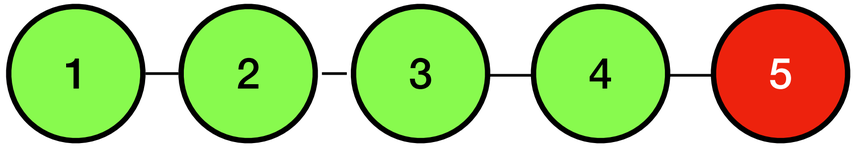

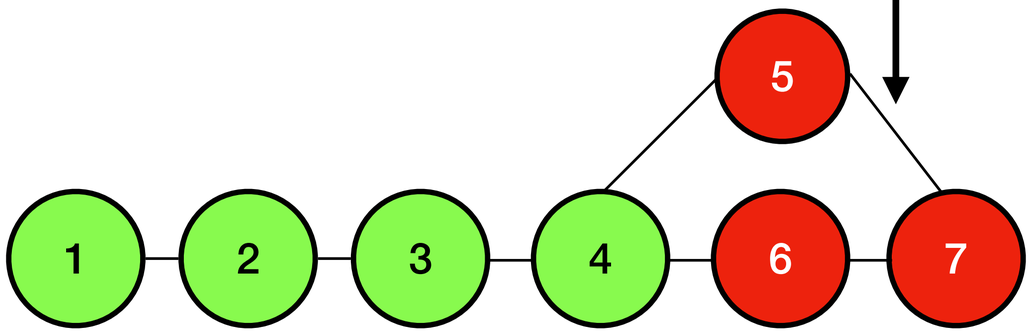

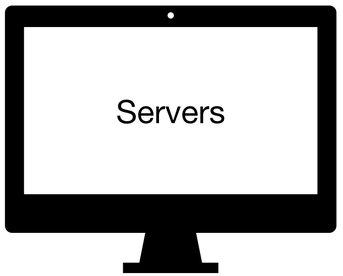

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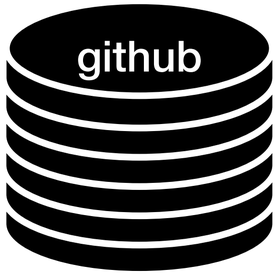

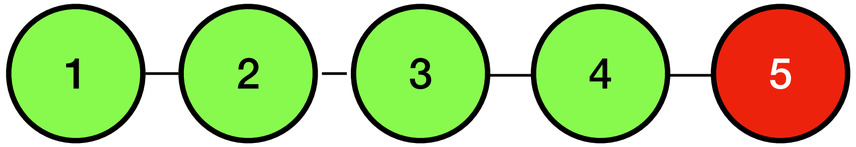

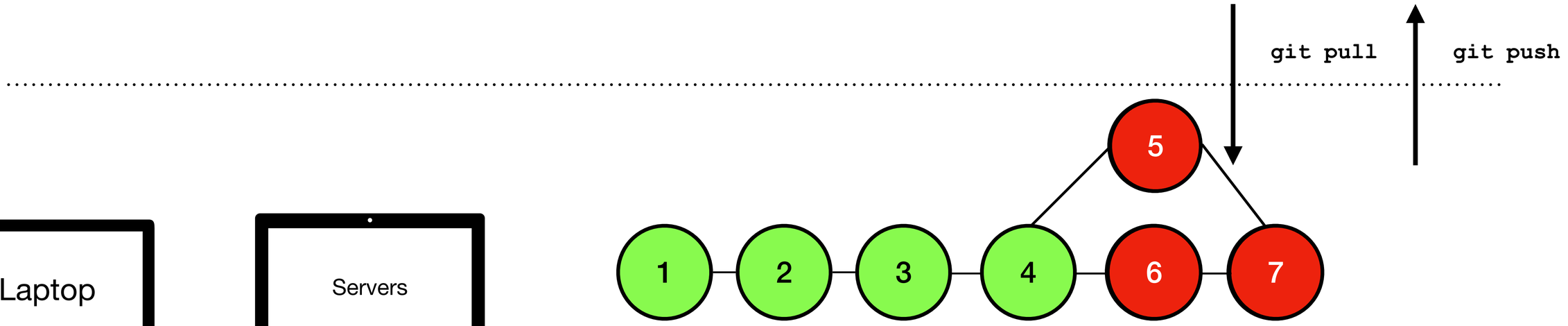

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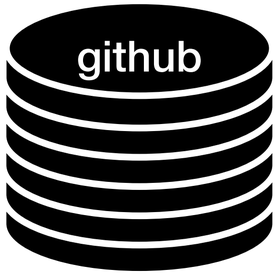

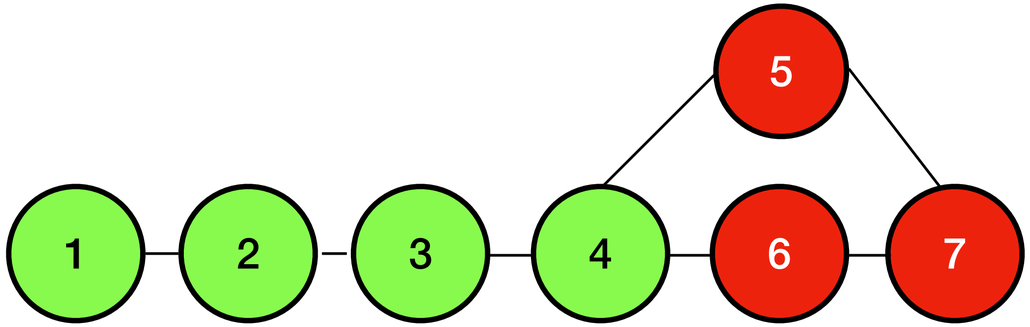

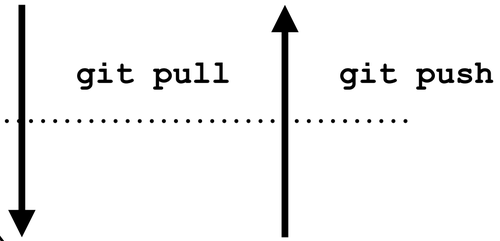

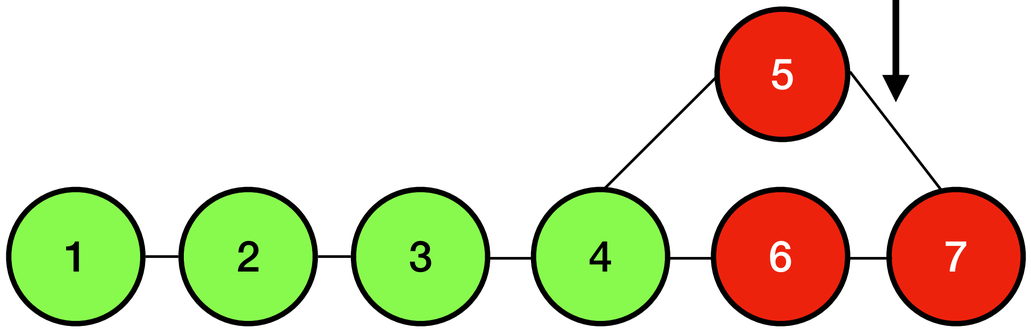

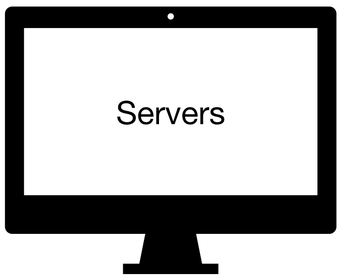

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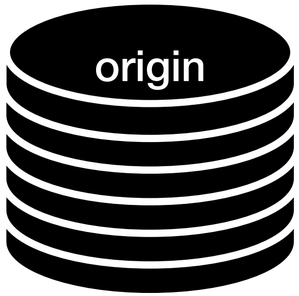

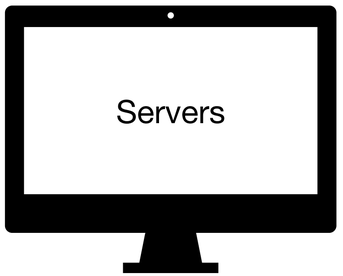

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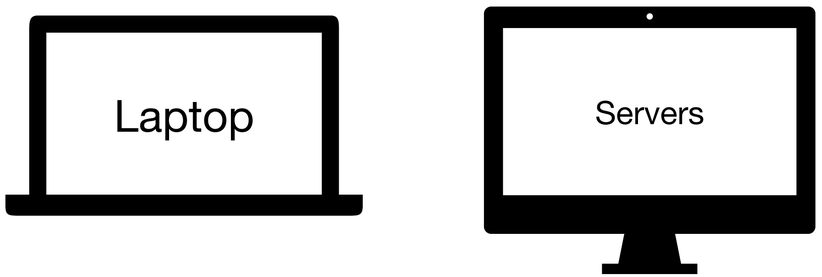

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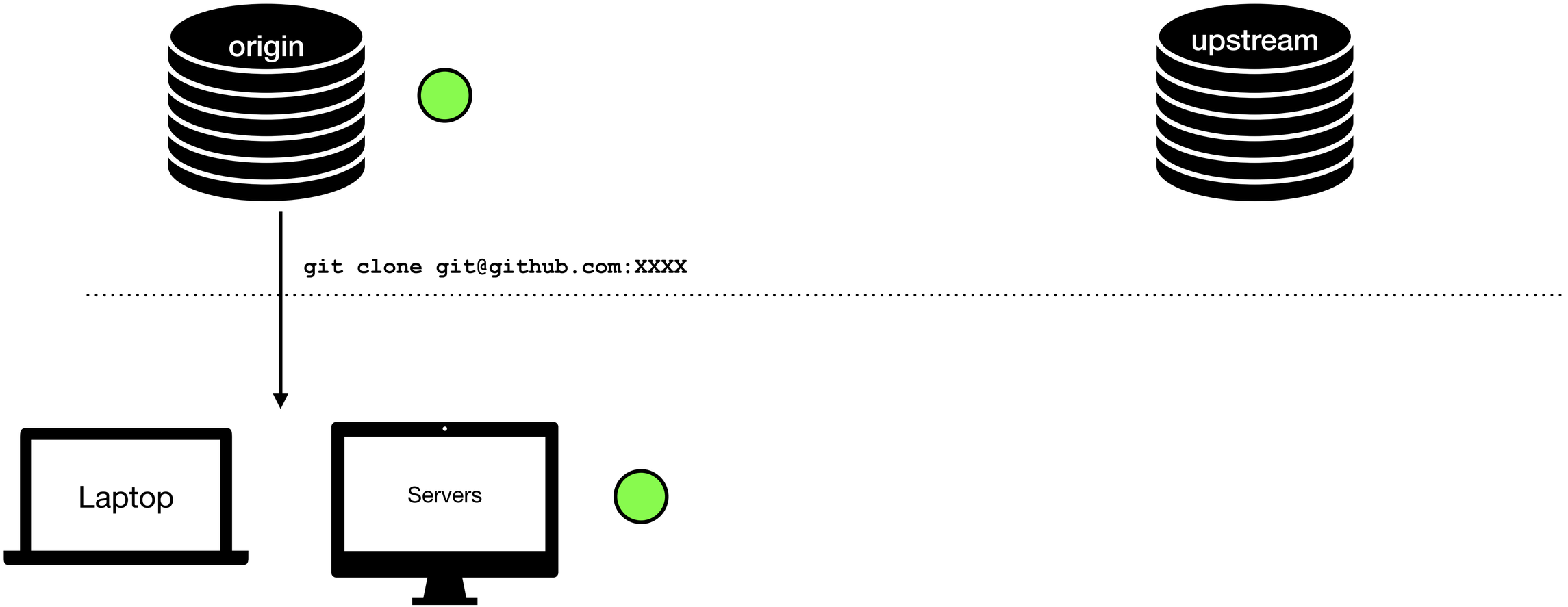
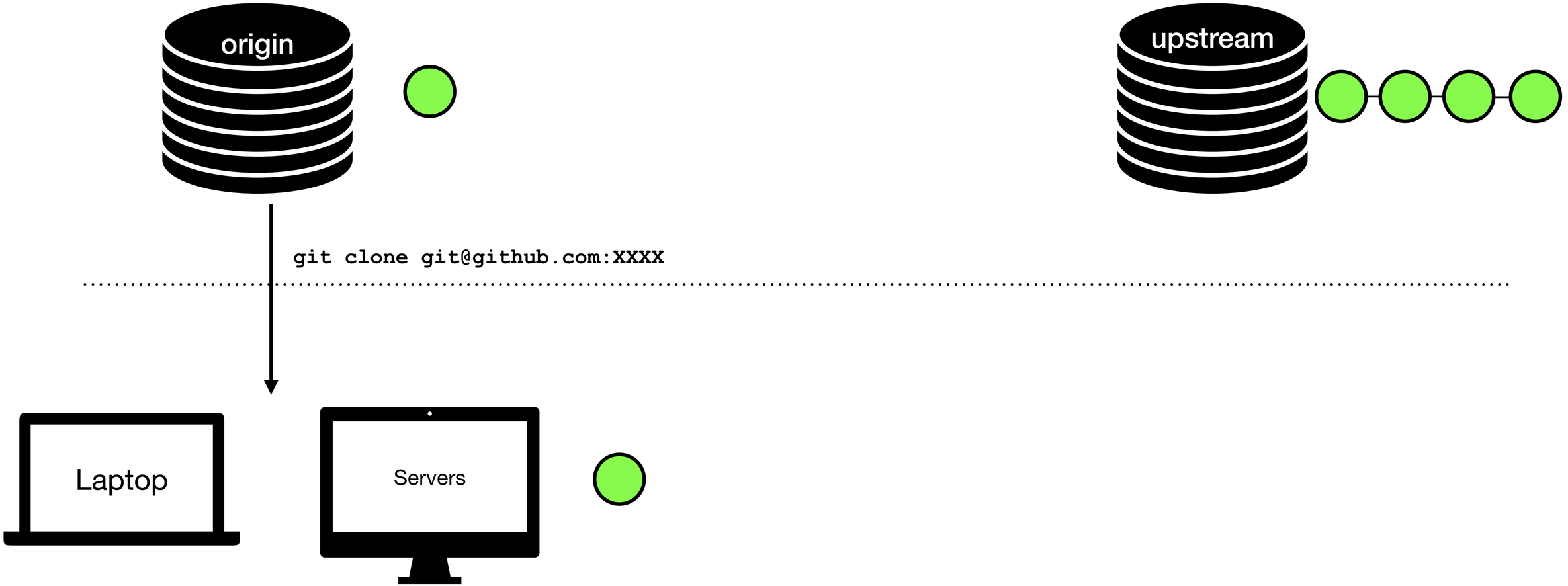


Environment

git



Environment

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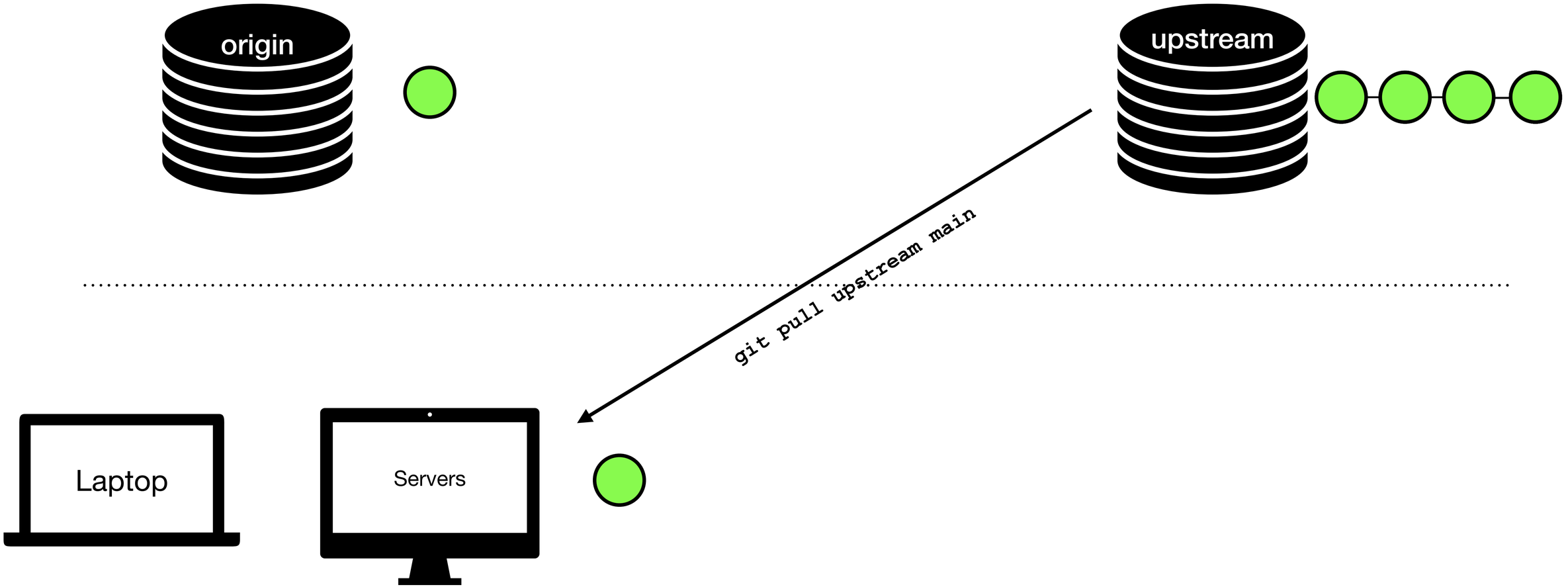

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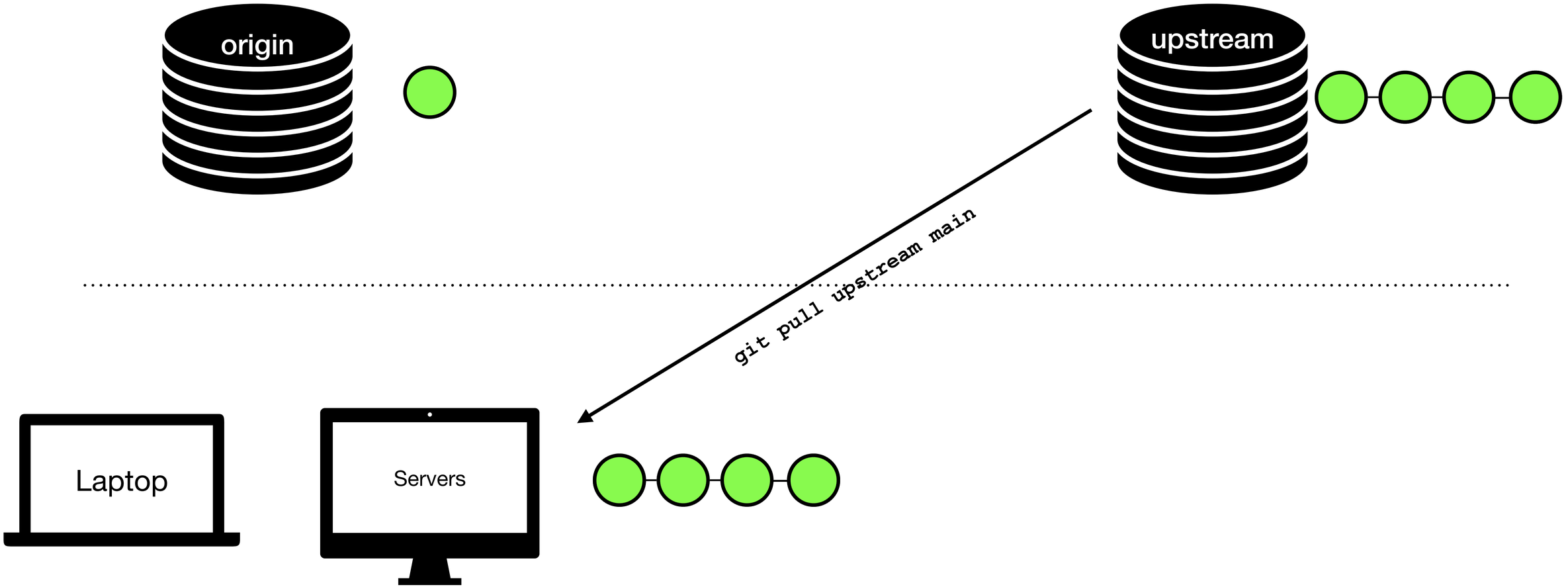

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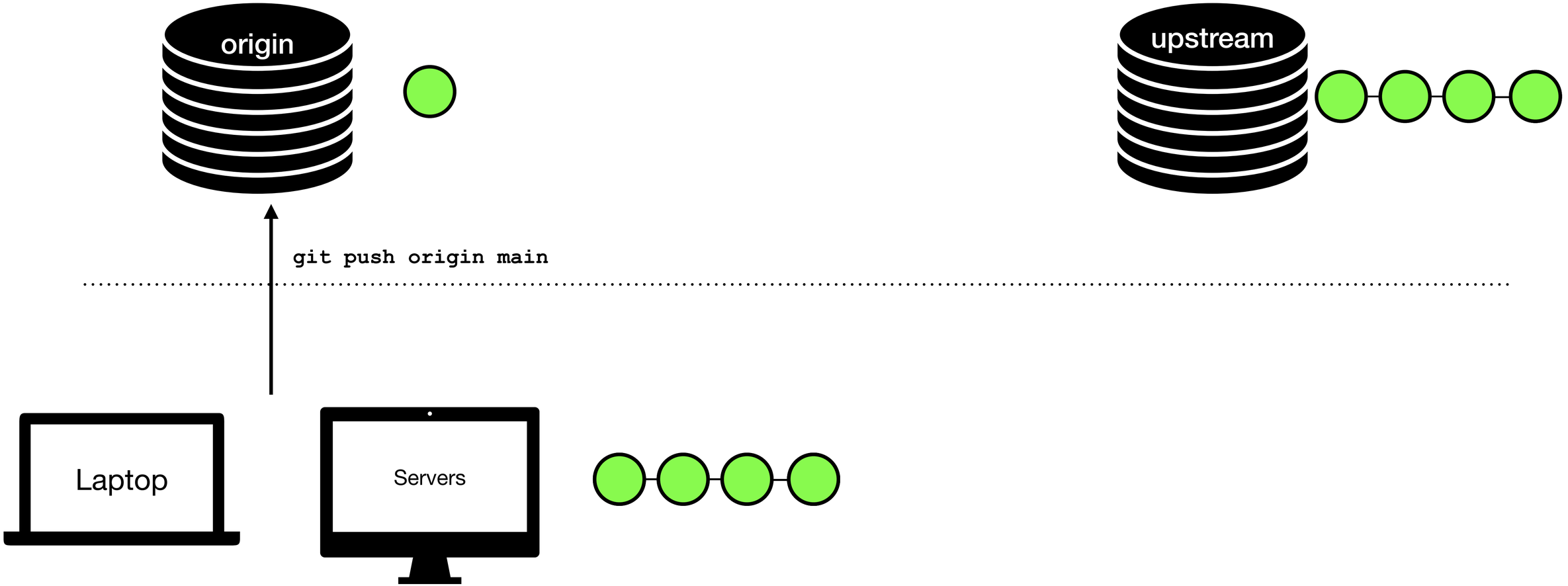

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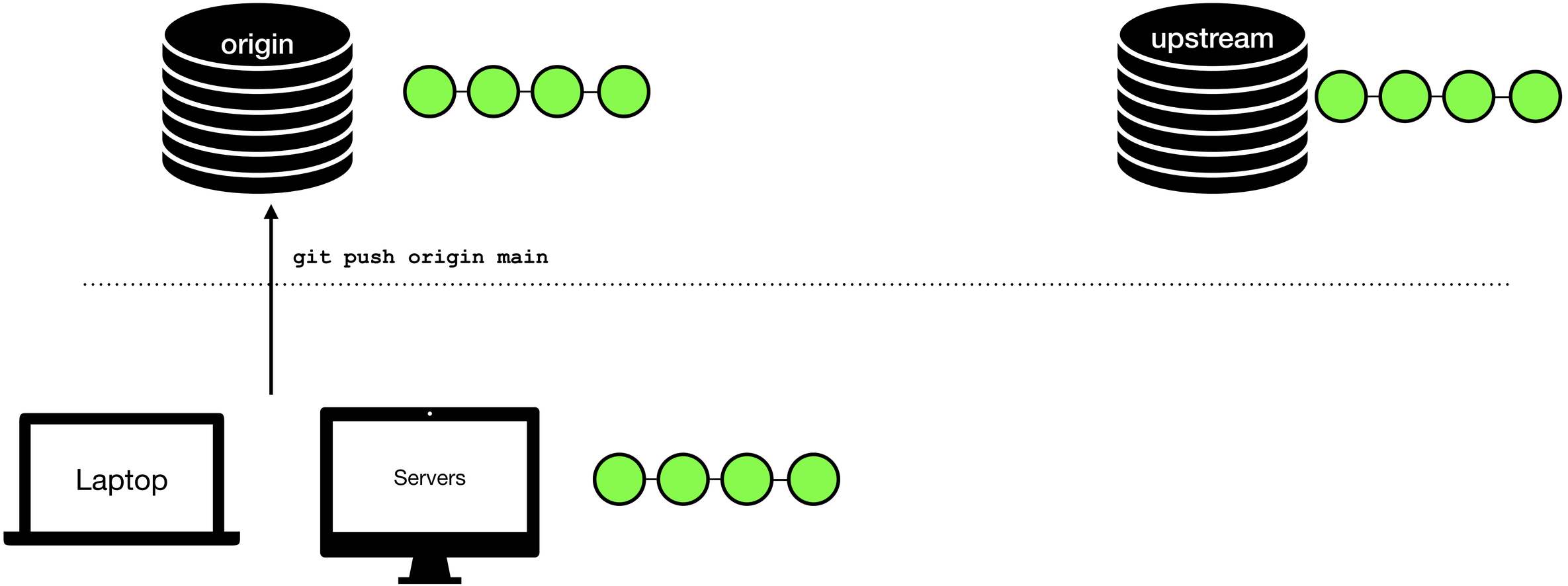

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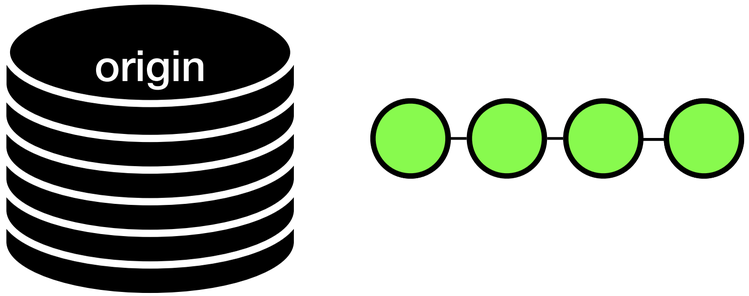

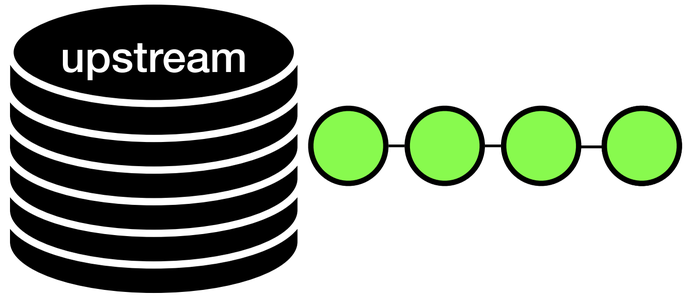

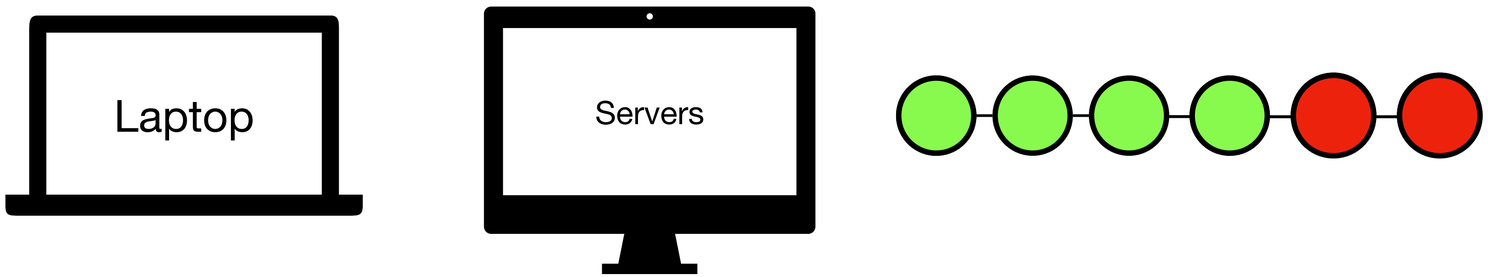

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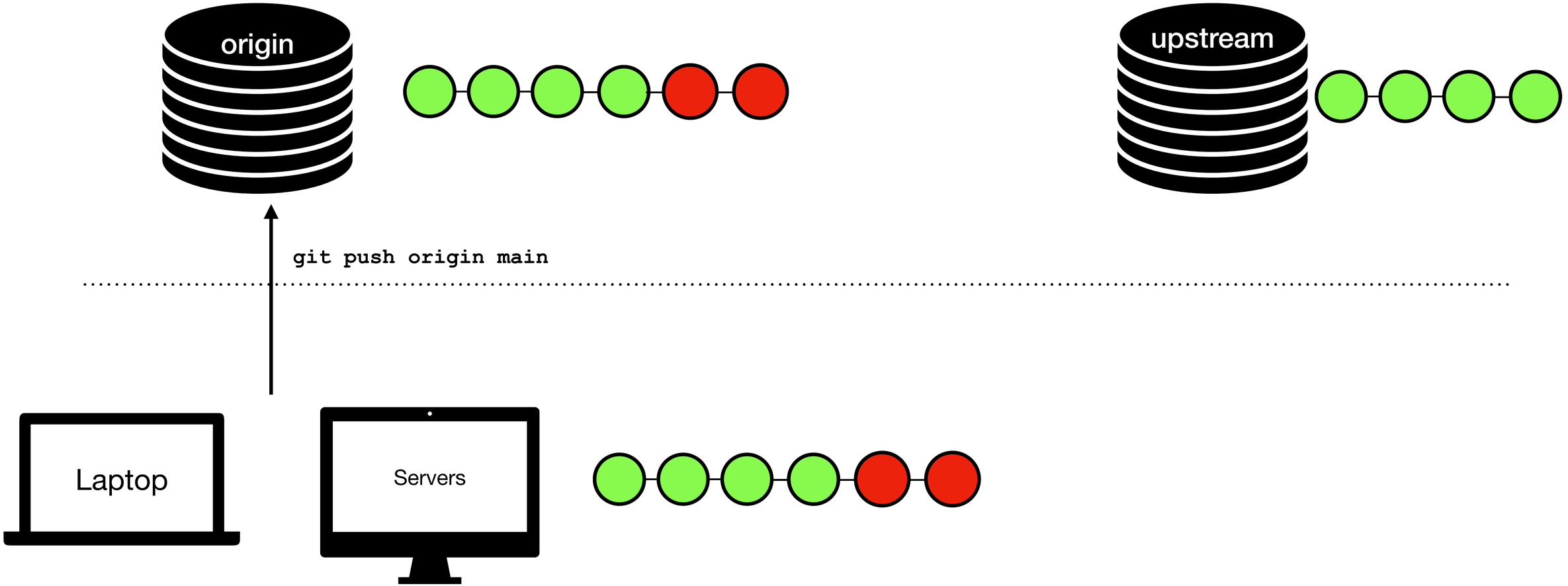

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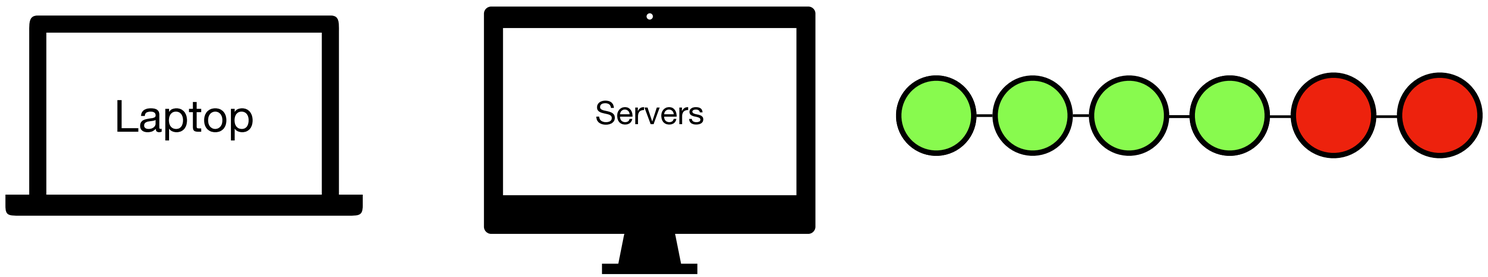

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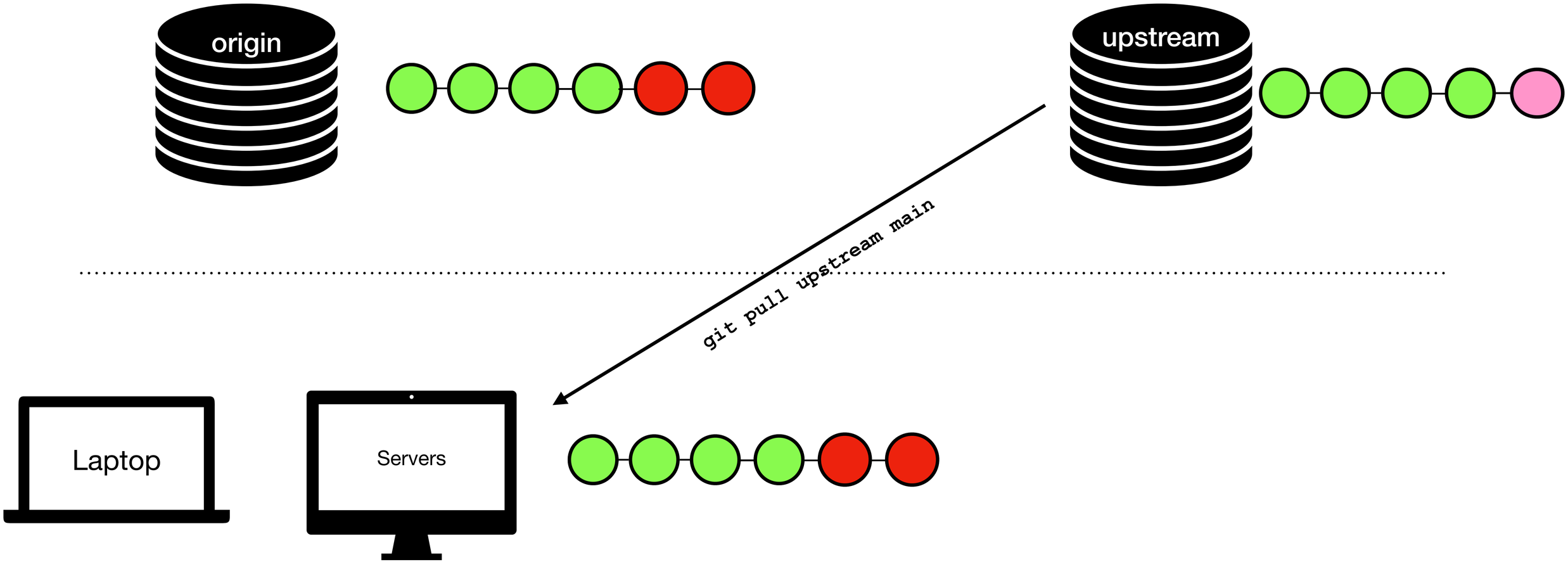

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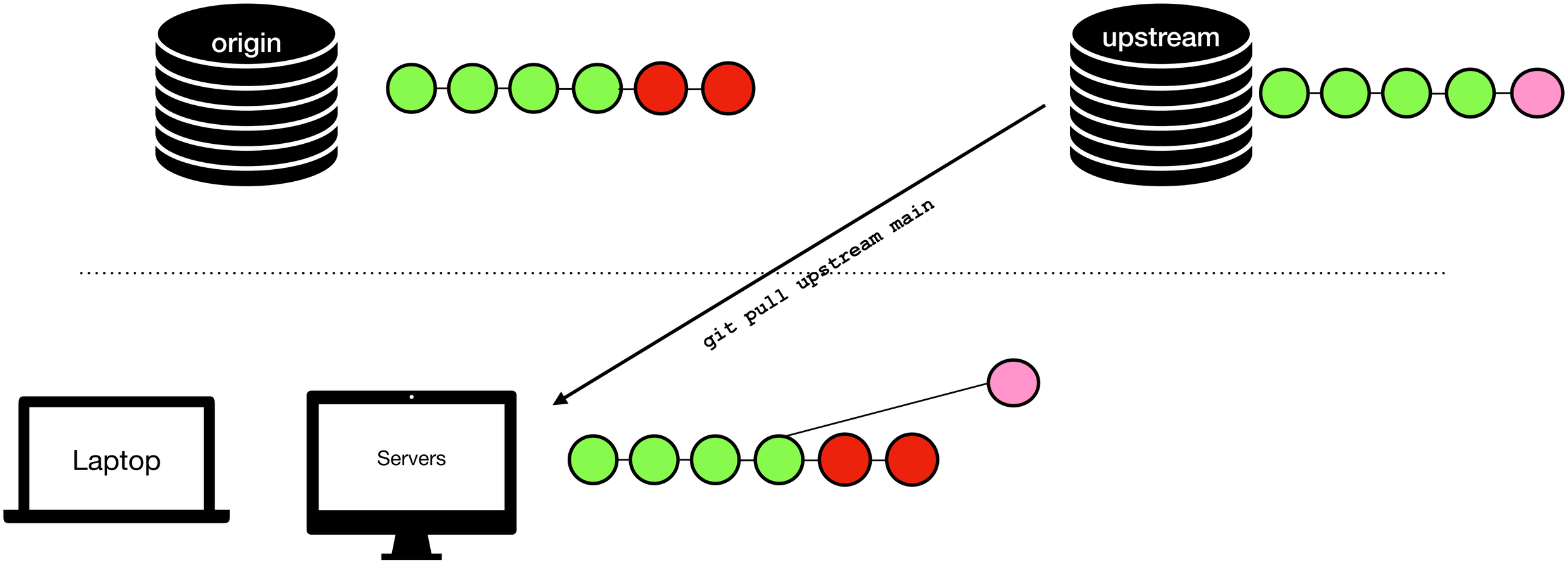
git



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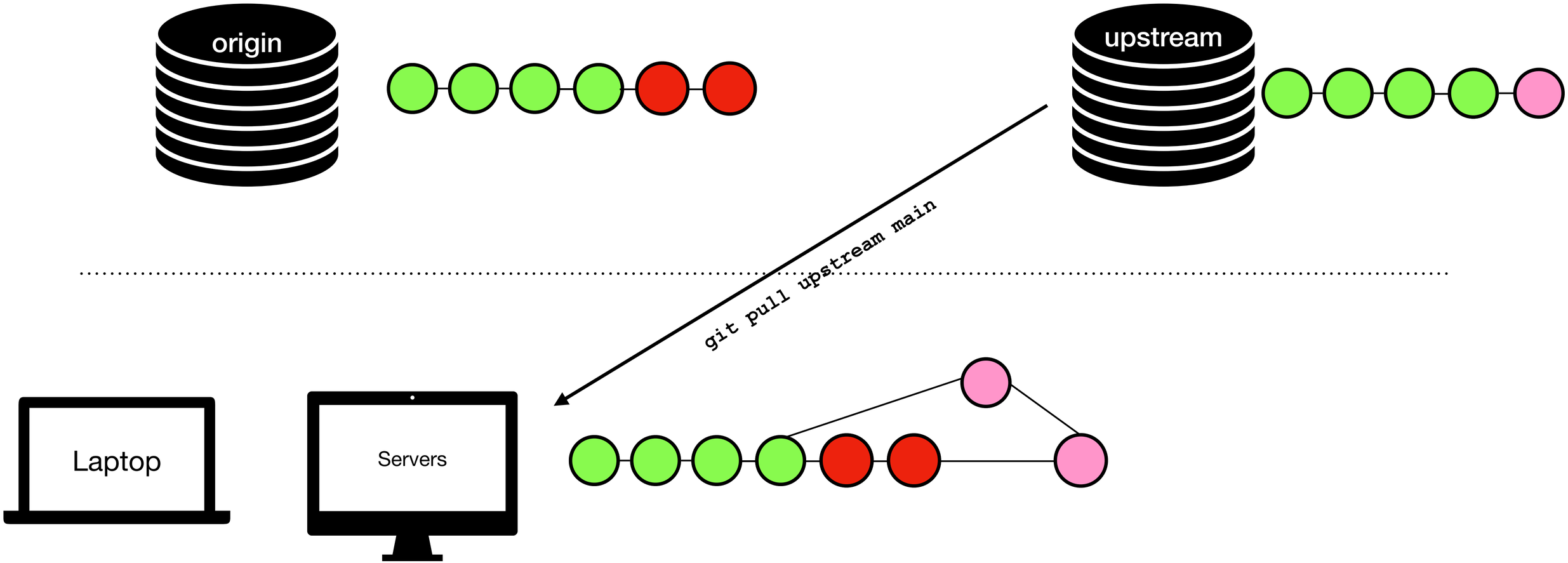
git



Terminal

Terminal

A very useful 70’s software

Titan: https://www.cs.cornell.edu/wya/AcademicComputing/text/earlytimesharing.html

Terminal

A very useful 70’s software

- Terminal used to be the only interface
- You can do everything inside the terminal!

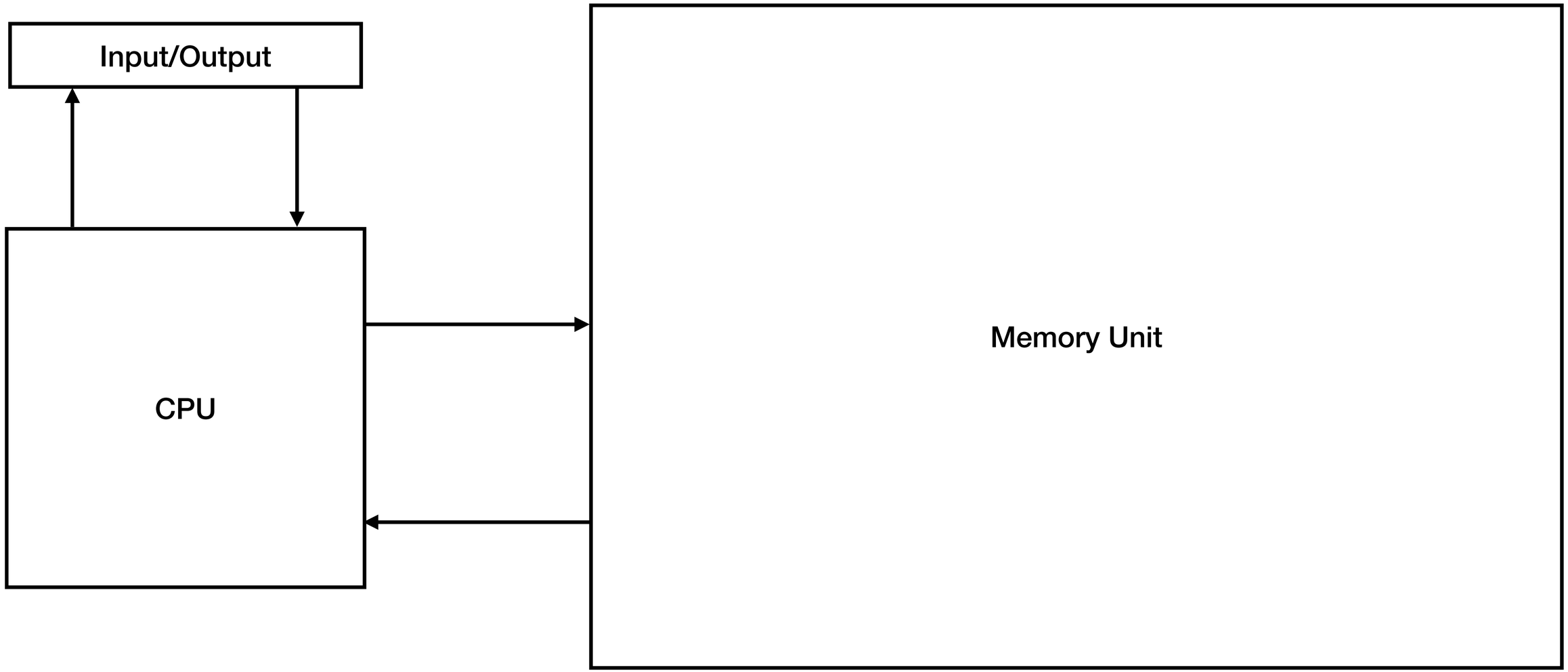
Terminal

Demo

- Navigation
- Running programs
- Scripting

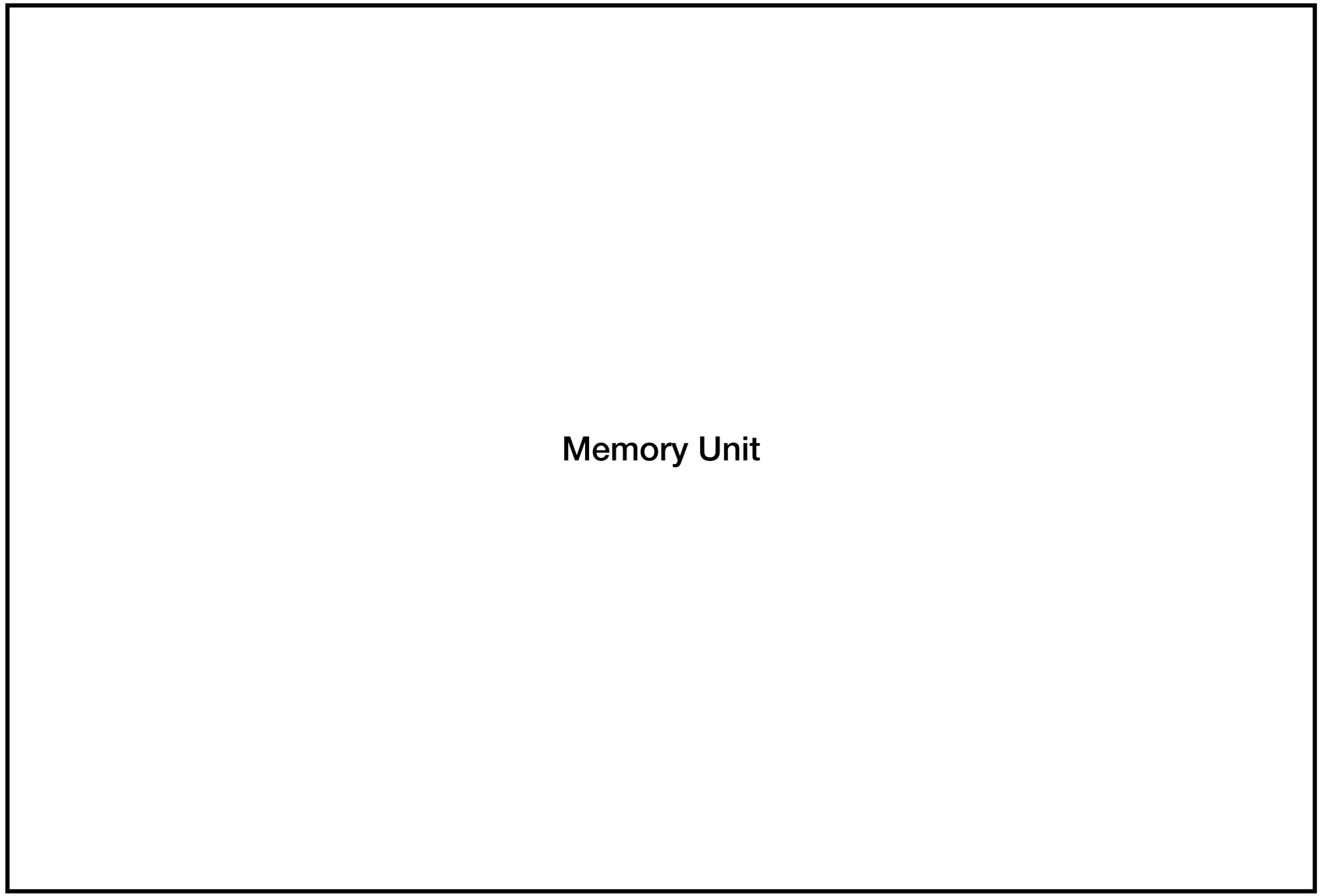
Variables, what are they?

A Von Neumann Machine



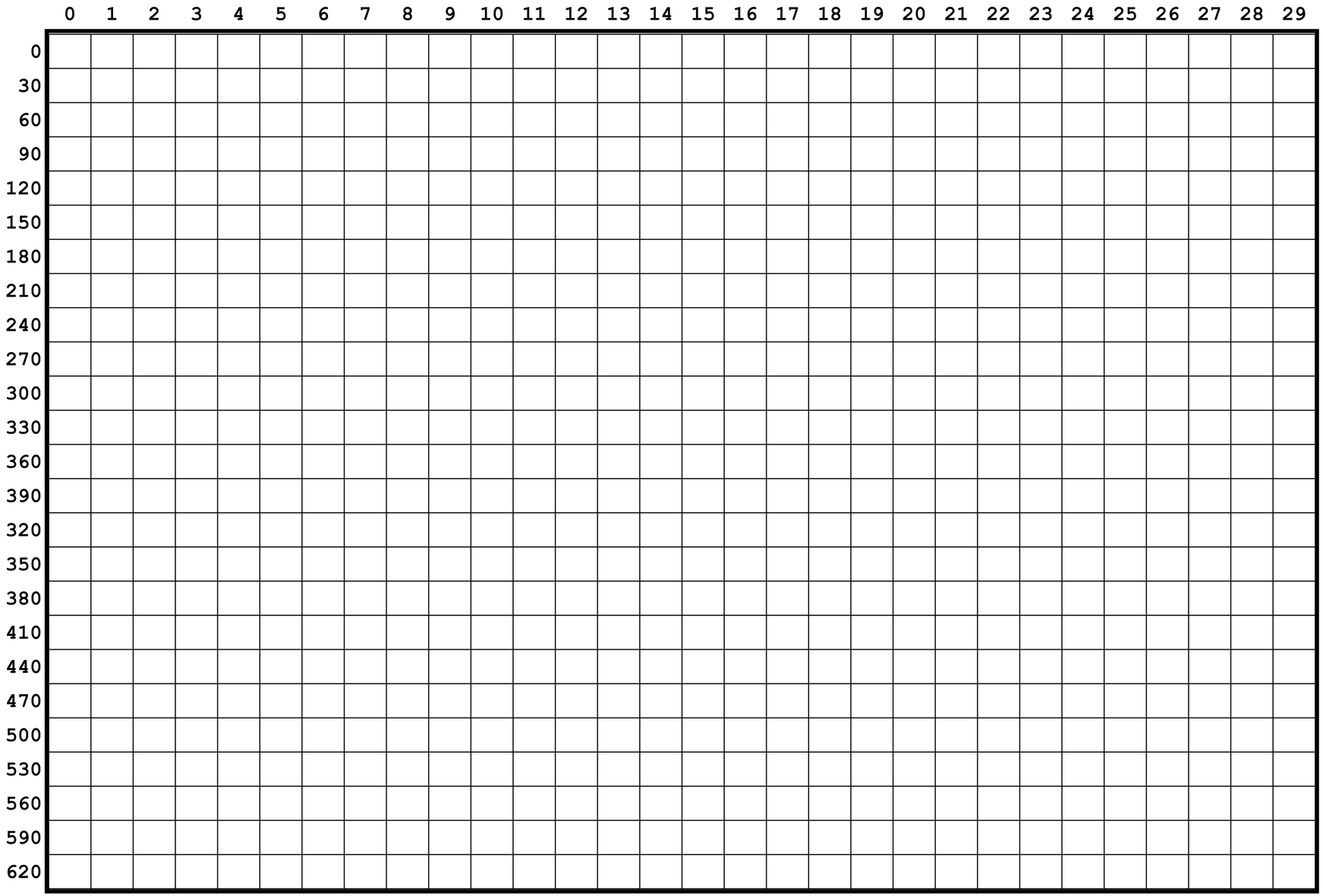
Variables

In Memory



Variables

In Memory



Variables

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Variables

In Memory

```
int number;
number = 10;
number = number + 5;

int another = number * 2;
```

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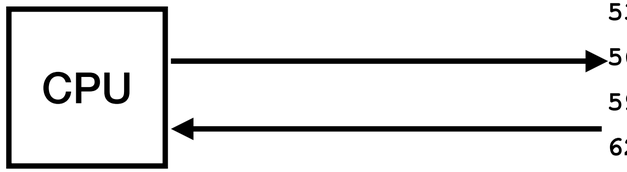

Variables

In Memory

```
int number;
number = 10;
number = number + 5;

int another = number * 2;
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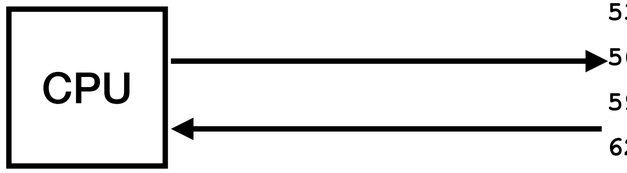

Variables

In Memory

```
int number;
number = 10;
number = number + 5;

int another = number * 2;
```

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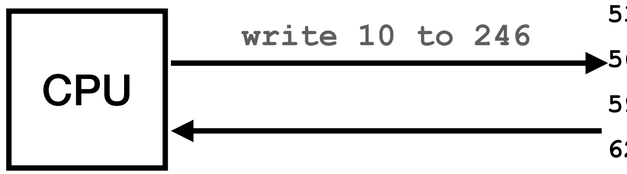

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number = 10;
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int another = number * 2;
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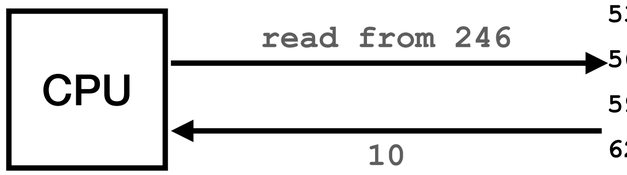

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number = 10;
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int another = number * 2;
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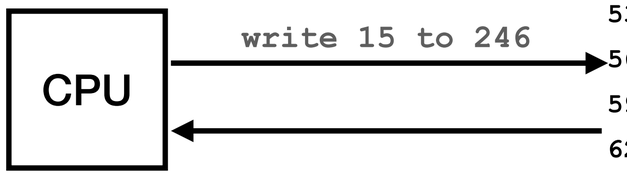

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number = 10;
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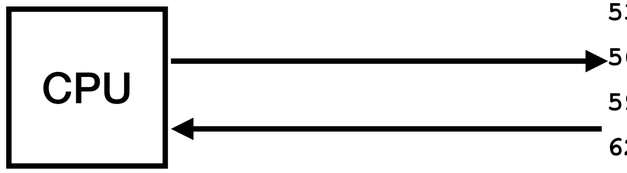

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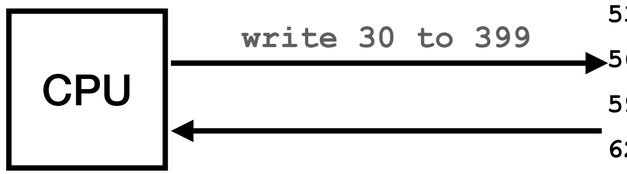
590	167	65	33	66	149	133	173	128	151	196	207	41	108	219	46	208	13	209	105	154	19	175	135	42	63	36	143	254	32	215
620	215	40	157	139	175	235	235	92	197	203	68	109	241	194	92	231	168	173	30	206	113	97	81	150	145	163	237	208	133	36



Variables

In Memory

- Variable is a named location in memory.
- Compiler keeps a table of names and their locations.
- A declaration (`int number;`) tells the compiler to find a space in memory.
- But how much space?