

GIT FUNDAMENTALS

**Open up a world of community
and collaboration**

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WHO AM I?

- Senior Technical Engineer @ Chocolatey Software
- 25+ years in IT in the defence, government, financial services and nuclear industry sectors.
- Scottish PowerShell & DevOps User Group Founder



Paul Broadwith



QUESTIONS AT END –
MAYBE?

QUESTIONS ANYTIME

AGENDA

- What actually is Git?
- What tools do I need for Git?
- Who is using Git and why do I need to use it?
- How does Git work?
- Essential Git commands you need to know!

WHO IS THIS AIMED AT?



Microsoft *Level 100*







Git

is not



GitHub

WHAT IS GIT?

WHAT IS GIT? | WHAT IS IT?

Wikipedia defines Git as:

Git is a version control system for tracking changes in computer files and coordinating work on those files among multiple people. It is primarily used for source code management in software development, but it can be used to keep track of changes in any set of files. As a distributed revision control system **it is aimed at speed, data integrity**, and support for distributed, non-linear workflows.

WHAT IS GIT? | WHAT IS IT?

Which means Git is:

Git is a version control system for tracking changes in computer files. It is aimed at speed and data integrity.

WHAT IS GIT? | WHAT IS IT?

Wikipedia defines Version Control System as:

... **version control is the management of changes to documents, computer programs, large web sites, and other collections of information. Changes are usually identified by a number or letter code, termed the "revision number"** ... Each revision is **associated with a timestamp and the person making the change.** Revisions can be compared, restored, and with some types of files, merged.

WHAT IS GIT? | WHAT IS IT?

Which means a version control system is:

Version control is the management of changes to collections of information. Changes are identified by a number associated with a timestamp and the person making the change.

WHAT TOOLS DO I NEED?

TOOLS | CHOCOLATEY PACKAGE MANAGER



<https://chocolatey.org>

<https://chocolatey.org/install>

TOOLS | REQUIRED SOFTWARE



Git Tools



<http://gitforwindows.org/>



```
> choco install git -y
```

TOOLS | RECOMMENDED SOFTWARE



GitLens
Git supercharged

posh-git



**GitHub Pull
Requests**



Git Extensions

PSCit



Git Credential Manager For Windows

WHO USES GIT?

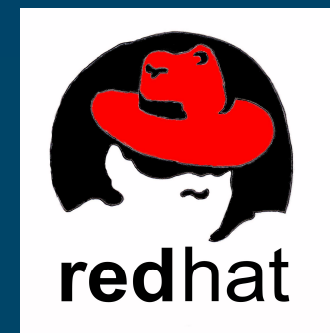
WHO USES GIT? | COMPANIES & PROJECTS YOU KNOW



Microsoft



NETFLIX



WHO USES GIT? | PROVIDERS & SOFTWARE



GitHub



GitLab



WHO USES GIT? | MICROSOFT WINDOWS & GVFS

Windows Builds (per day)

1760

Active Branches

4352

Pull Requests (per day)

2500

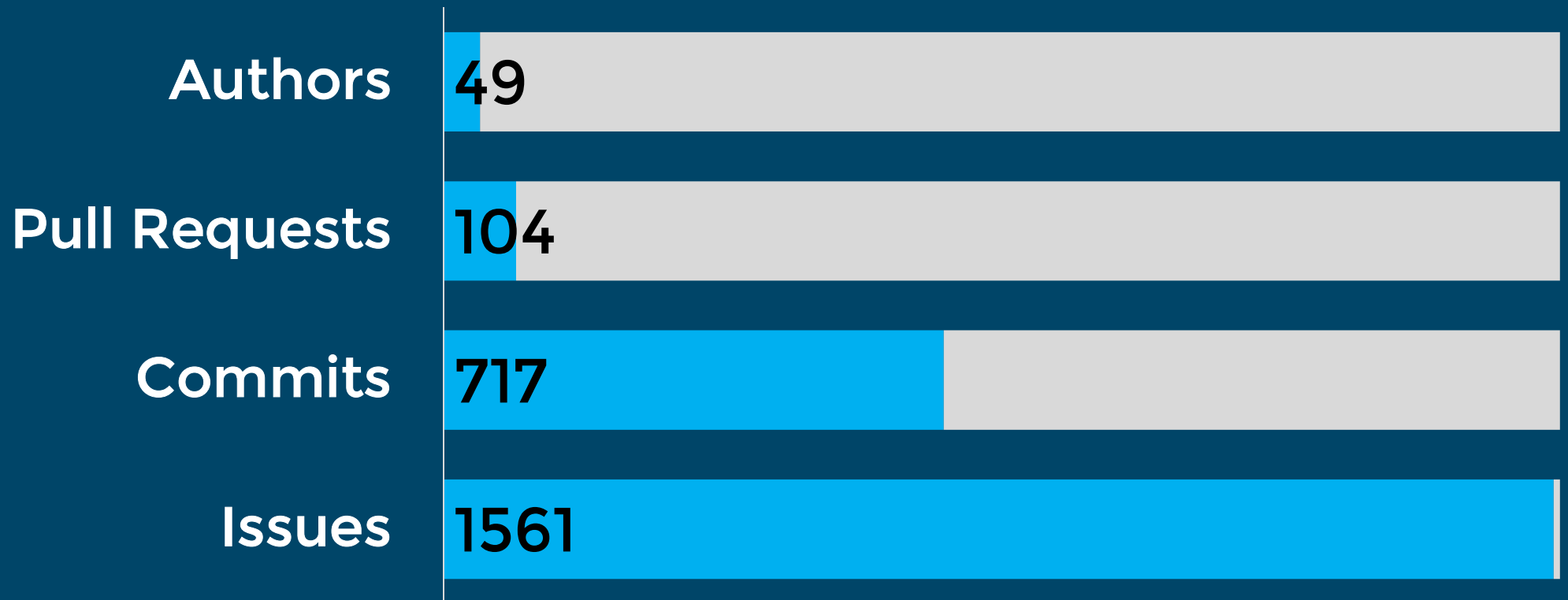
Code Pushes (per day)

8421

As at May 2017 (Using GVFS)

<https://blogs.msdn.microsoft.com/bharry/2017/05/24/the-largest-git-repo-on-the-planet/>

WHO USES GIT? | VISUAL STUDIO CODE ON GITHUB



16 December 2017 to 16 January 2018

WHO USES GIT? | DSCRESOURCES REPOSITORY

475 Pull Requests

300 Closed Issues

Since 1 January 2018

<https://blogs.msdn.microsoft.com/powershell/2018/09/13/desired-state-configuration-dsc-planning-update-september-2018/>

WHO USES GIT? | PEOPLE LIKE YOU



**WHY DO I NEED
TO USE GIT?**

WHY DO I NEED TO USE GIT? | POWERSHELL DEV

I write PowerShell ...

... I'm not a developer

WHY DO I NEED TO USE GIT? | POWERSHELL DEV

If you write code ...

... you are a developer

WHO USES GIT? | 2017 GITHUB USE



1 Billion Commits



47 Million Pull Requests

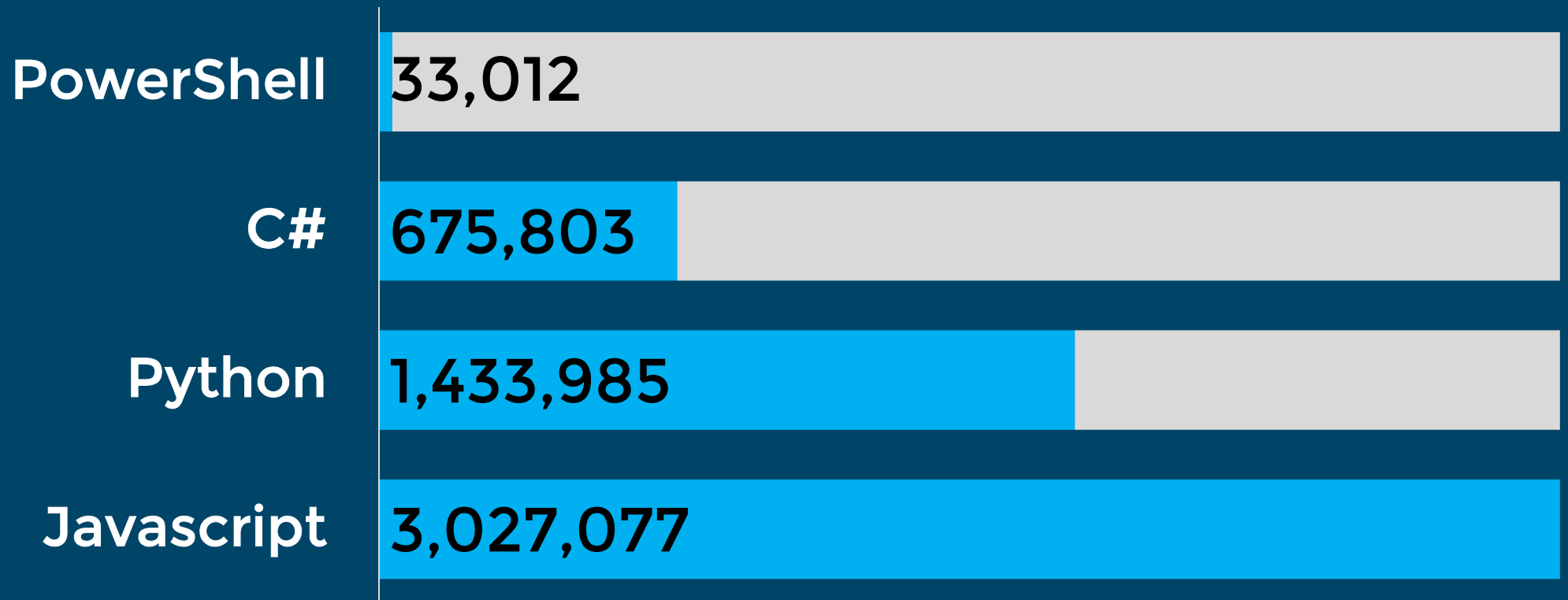


25.3 Million Active Repositories



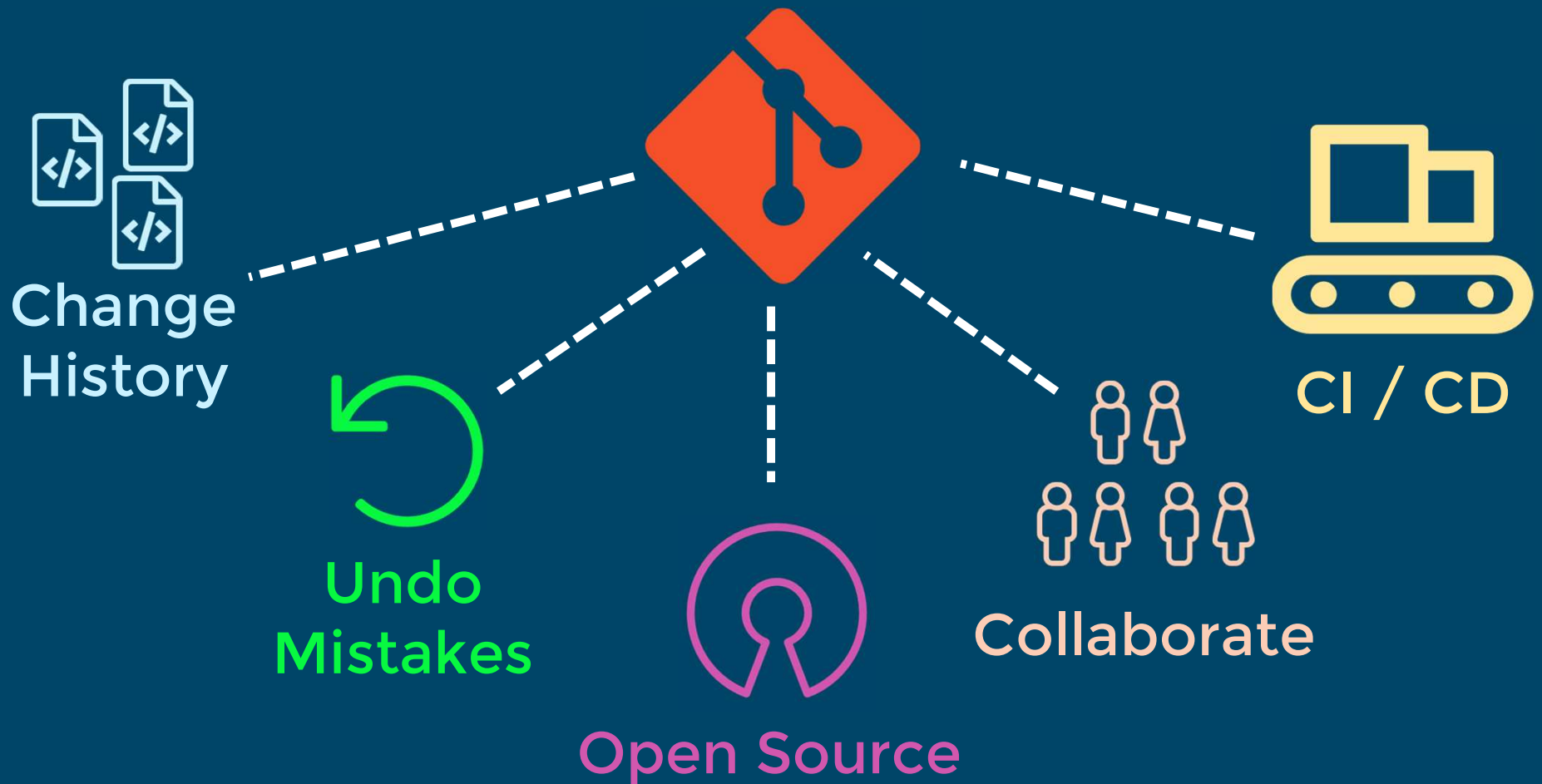
24 Million Developers

WHO USES GIT? | GITHUB REPO BY LANGUAGE



12 September 2018

WHY DO I NEED TO USE GIT? | GIT HAS YOUR BACK

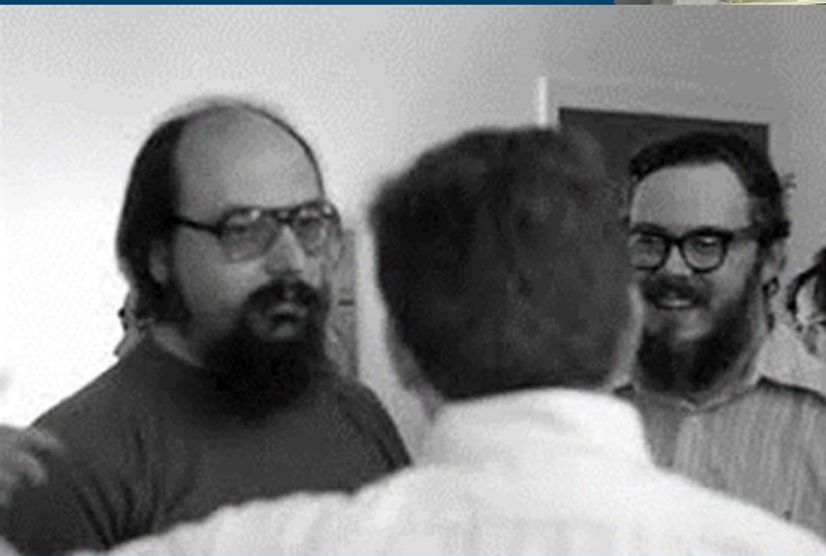


WHY DO I NEED TO USE GIT? | DON'T HIDE YOUR CODE

I will not write any more bad code
I will not write any more bad code
I will not write any more bad code
I will not write any more bad code
I will not write any more bad code
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WHY DO I NEED TO USE GIT? | BEARDY DEV



HOW DOES GIT WORK?

3 Stages

HOW DOES GIT WORK? | 3 STAGES

```
> git status
```

```
> git add  
<. | FILES>
```

```
> git commit  
-m 'Message'
```



Change
source files



Stage
changed
files



Commit
changes



Unstaged



Staged



Committed

HOW DOES GIT WORK? | 5 FUNDAMENTALS OF GIT



repository



branches



commit

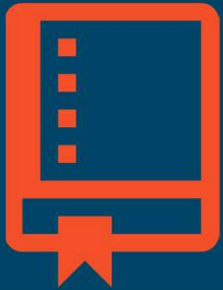


fork *



pull requests

HOW DOES GIT WORK? | REPOSITORY

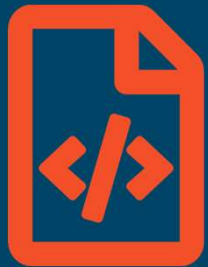


Repository / Repo - terminology - both used

Just a folder where you store your
project files



HOW DOES GIT WORK? | SPECIAL REPOSITORY FILES



File and folder name patterns that Git should ignore

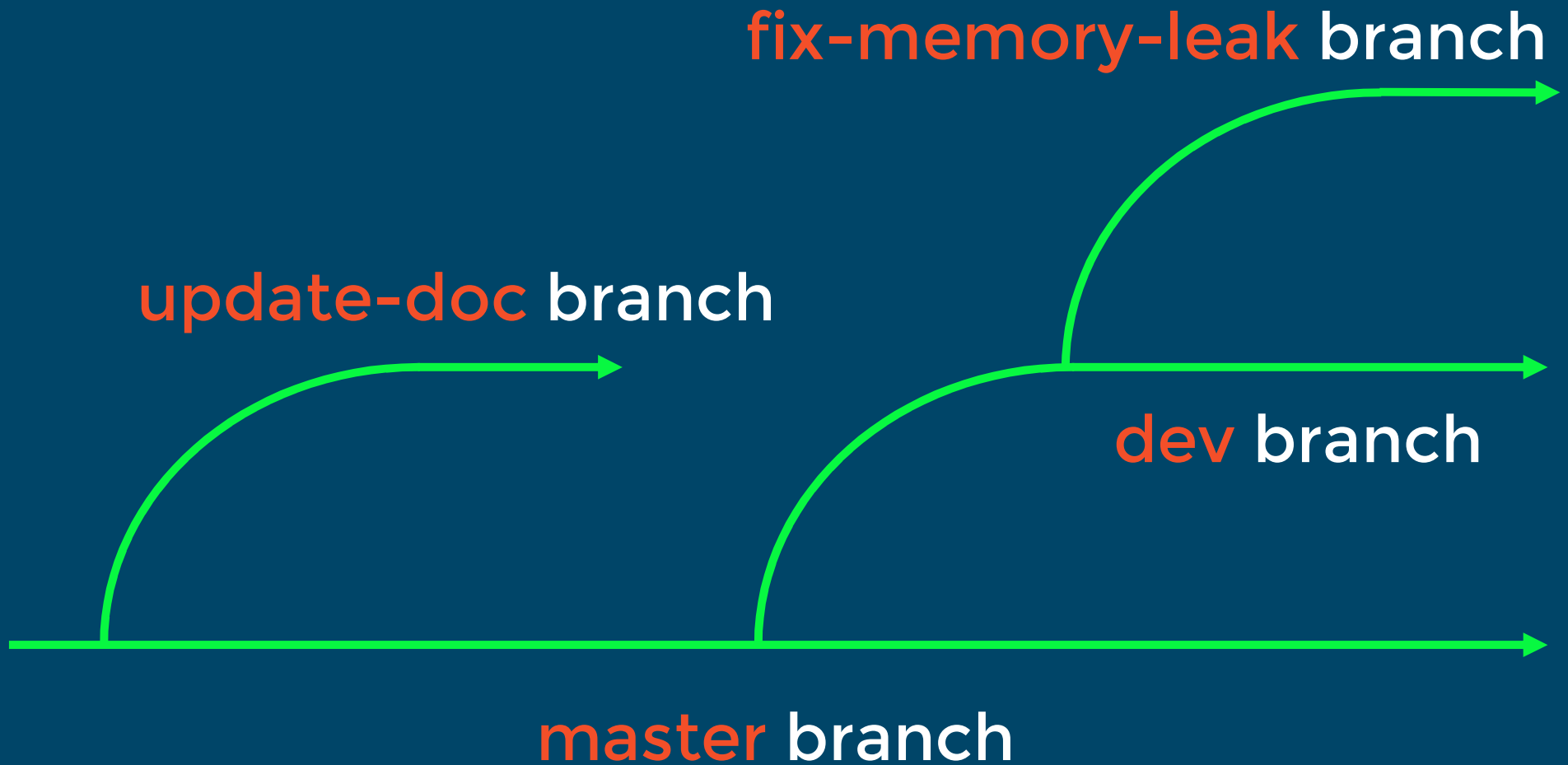
`.gitignore`

History, index and other management files for Git



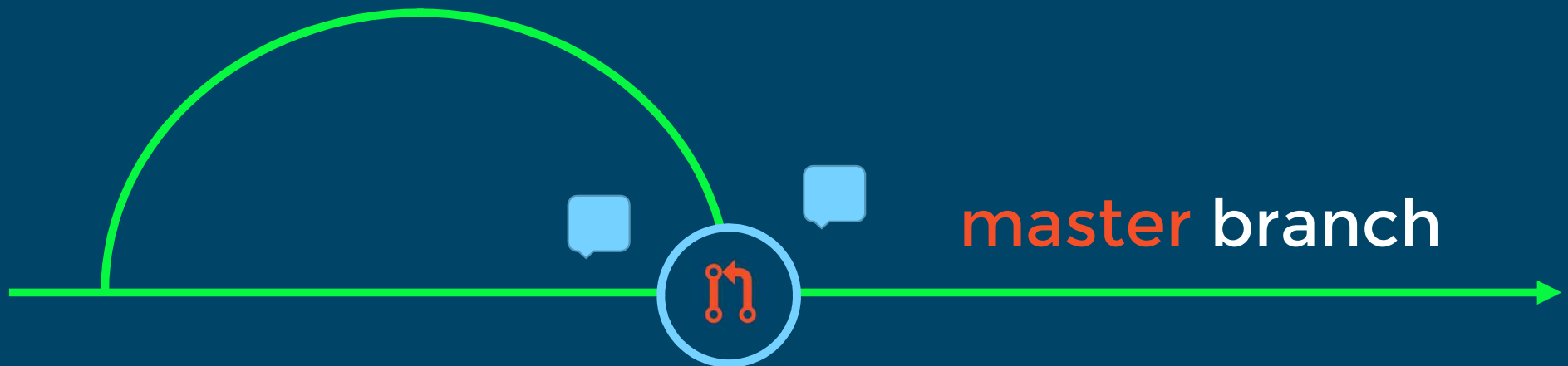
`.git`

HOW DOES GIT WORK? | BRANCHES



HOW DOES GIT WORK? | PULL REQUEST

update-doc branch



Lets others know about a change you have made.

Allows review and discussion around those changes.

HOW DOES GIT WORK? | COMMIT

```
> git commit  
-m 'Message'
```



Commit
changes

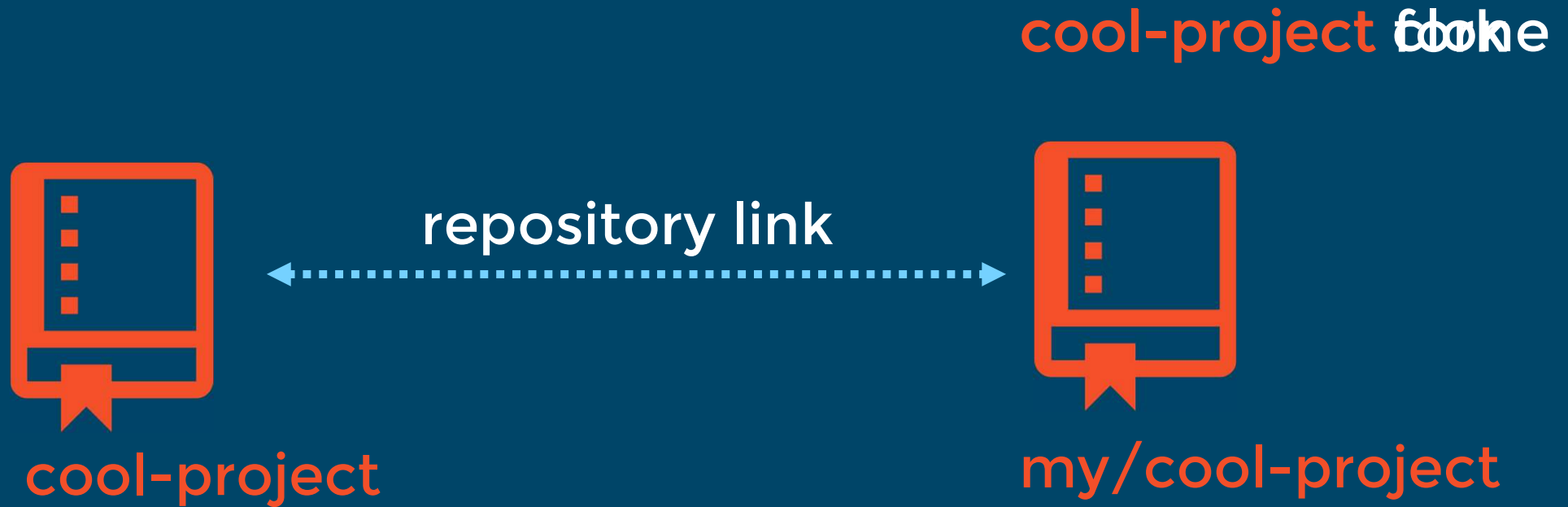
When one or more changes have been applied to a branch, it is called a ...

... **commit**



Committed

HOW DOES GIT WORK? | FORK (vs. CLONE)



Forking a repo is simply creating a **linked** copy of that repository. Without the link, it's just a **clone** of the repository. pushed to the original repository.

ESSENTIAL GIT COMMANDS YOU NEED TO KNOW!

ESSENTIAL GIT COMMANDS? | 8 OF THEM



status



commit



add



pull



checkout



clone



push



remote

HOW GIT WORKS | GIT STATUS

Pull



Screenshot of status

```
> git status
```

HOW GIT WORKS | GIT CLONE

Pull



```
> git clone <URL>
```

HOW GIT WORKS | GIT PULL

Pull



```
> git pull
```

HOW GIT WORKS | GIT ADD

Pull



```
> git add <. | FILES>
```


HOW GIT WORKS | GIT COMMIT

Pull



```
> git commit -m '<MESSAGE>'
```

HOW GIT WORKS | GIT PUSH

```
> git push
```



Push

HOW GIT WORKS | GIT CHECKOUT

```
> git checkout [-b] <BRANCH>
```

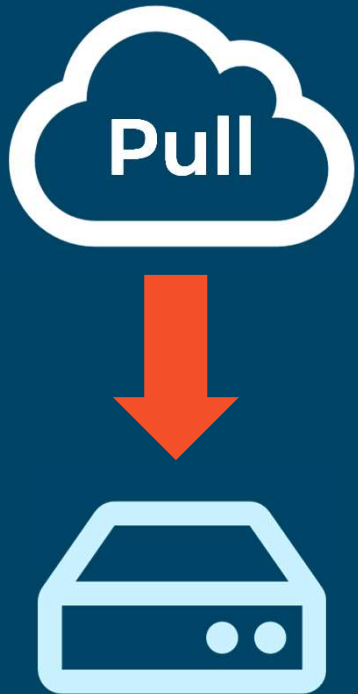


Push

DEMO 1

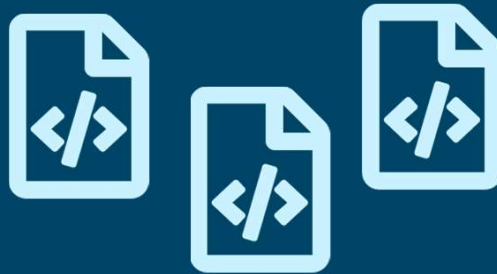
HOW GIT WORKS | STANDARD GIT CYCLE

```
> git pull
```

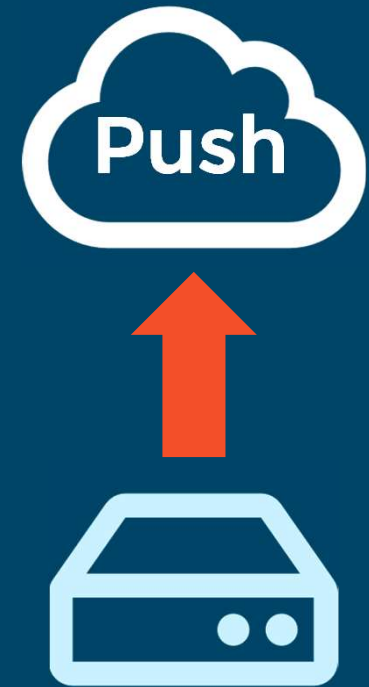


```
> git add .  
> git commit -m  
"Initial commit"
```

 Commit



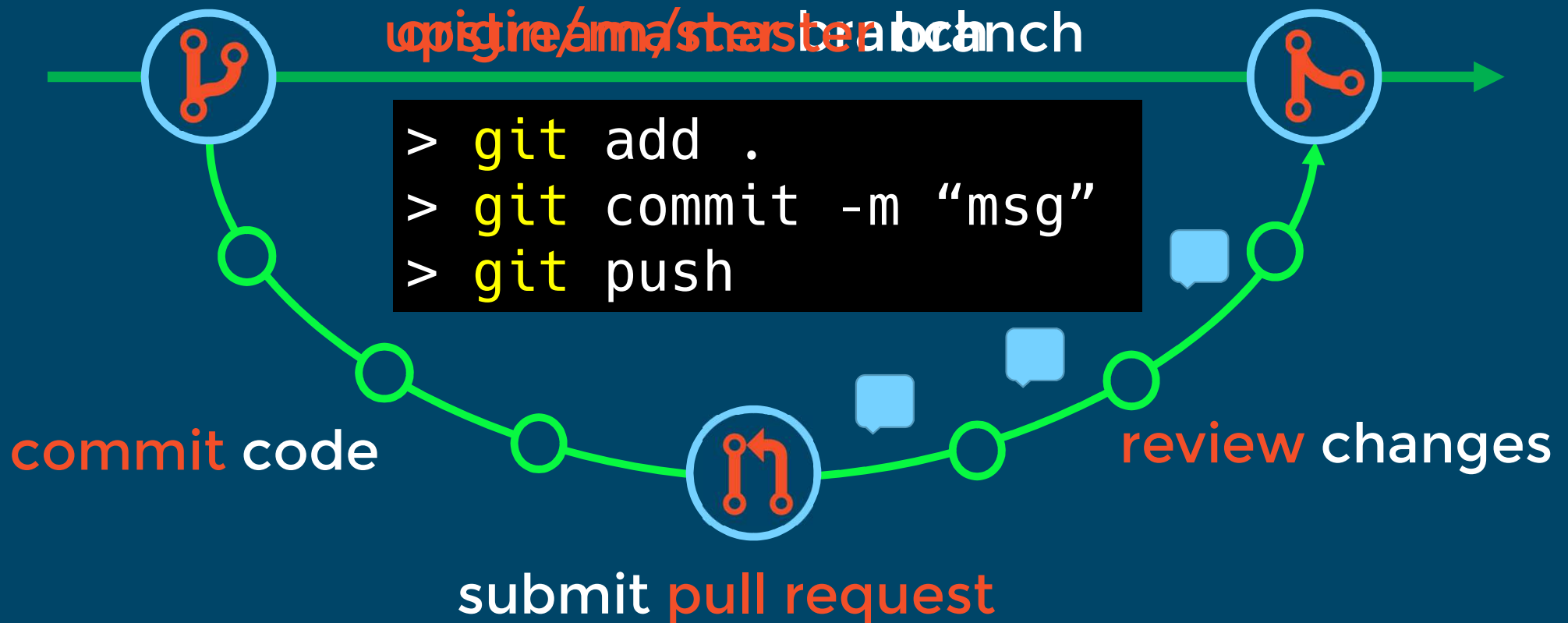
```
> git push
```



DEMO 2

HOW DOES GIT WORK? | FORK REPOSITORY FLOW

remove-aliases branch created from origin/master
remove-aliases branch merged to upstream/master



ESSENTIAL GIT COMMANDS? | USEFUL COMMANDS



reset



rebase



fetch



merge



stash

AGENDA QUESTIONS

- What actually is Git?
- What tools do I need for Git?
- Who is using Git and why do I need to use it?
- How does Git work?
- Essential Git commands you need to know!

Git is a Version Control System

Git Tools, Credential Manager, Git Extensions (& Git Lens?)

EVERYBODY and it will help you write better code!

5 fundamentals, 3 stages

8 commands



Design with
community
in mind

2014

24 PULL REQUESTS

GIVING BACK LITTLE GIFTS OF CODE FOR CHRISTMAS

HACKTOBERFEST 2018 - COMING SOON

Hacktoberfest

Congratulations!

You're now a `git`!

QUESTIONS?



Paul Broadwith



pauby.com



[@pauby](https://twitter.com/pauby)



github.com/pauby



[linkedin.pauby.com](https://linkedin.com/company/pauby)

pau.by/talks