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Intro to git

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DEVLIT-4030

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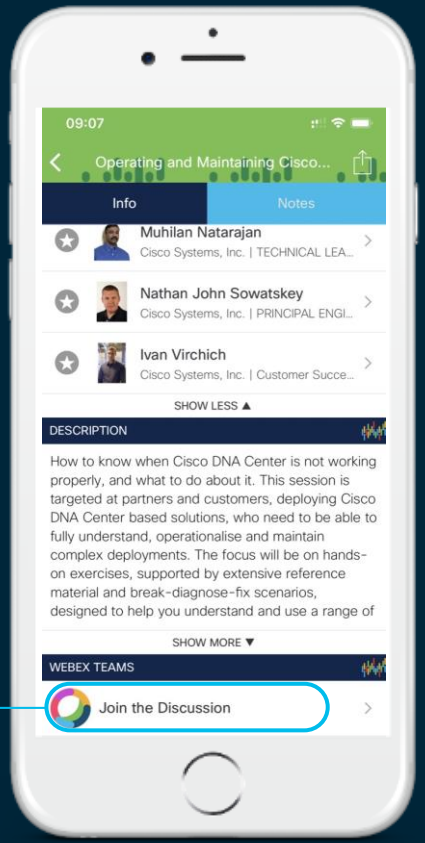


Agenda

- Introduction
- Quick overview of Git
- Workshop
- Resources

What is Version Control?

The Need for Version Control

How do I make incremental changes and share my work with others?

How do I go back to the version of this file from (yesterday, last week, last year, ...)?

What changed between version X and version Y of a file?

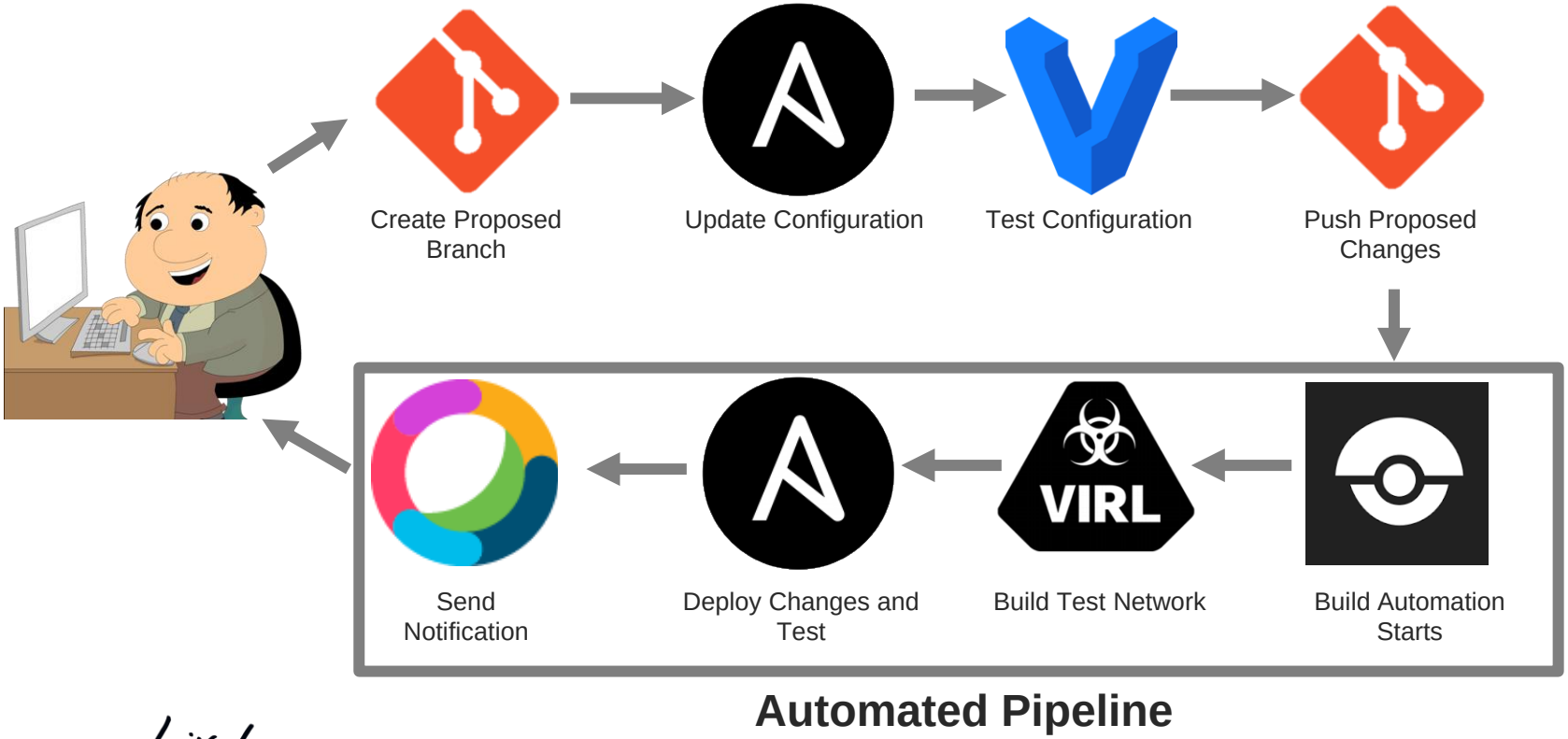
People have been making changes to the same file (or set of files)... How do I reconcile and merge all these changes?

What is Version Control?

- A system that manages changes to a set files in order to keep a history of changes
- Version Control is similar to:
  - Snapshots of VMs
  - Incremental backups of files
  - Wiki versioning
- When you make a mistake or want to do some experimenting, you can do that in a safe way.

What does this have to do with Networking or Data Center?

NetDevOps CICD Pipeline Demonstration



Why Use Version Control?

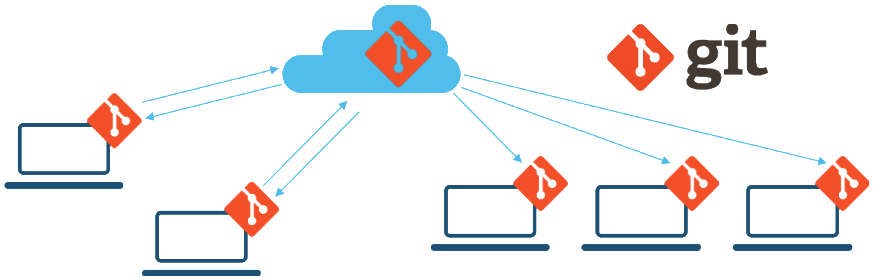
To Protect yourself and others

What is Git?

Git

- An open source distributed version control system
- Designed with performance, security and flexibility in mind
- Stores snapshots of the full file instead of diffs
  - Changes are stored in trees
  - Trees contain changed files
  - Commits contain trees

Git vs. GitHub



Git is an open source Distributed Version Control System

GitHub is a commercial company, that runs GitHub.com based on Git Version Control System

Alternatives to GitHub

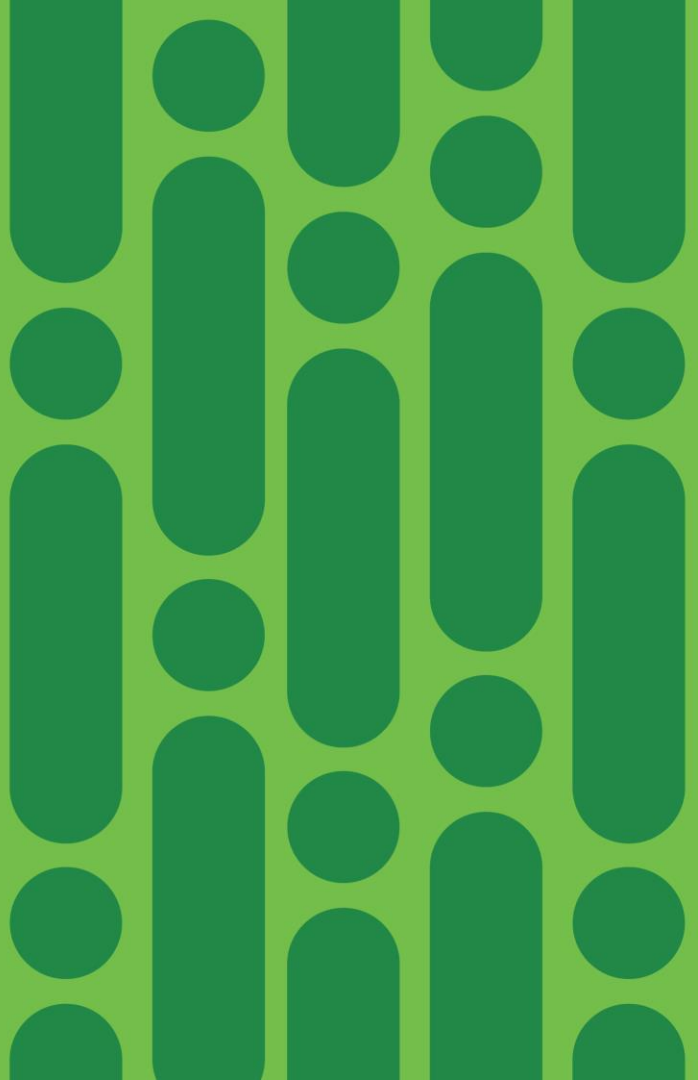
: https://bitbucket.org/

: https://about.gitlab.com/

: https://sourceforge.net/

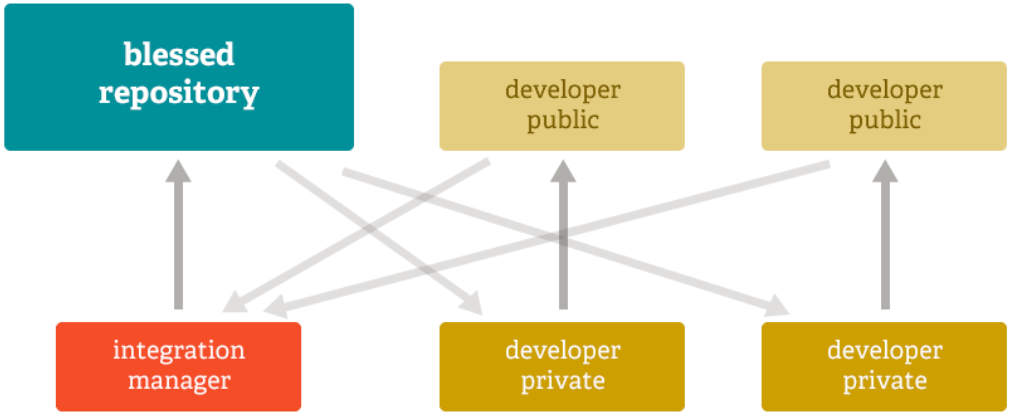
: https://gogs.io/

Git: Technical Overview



DISTRIBUTED VERSION CONTROL

- Opens up to new workflows: git flow
- Each system has an exact replica of the repo as other collaborators.



https://git-scm.com/images/about/workflow-b@2x.png

Basic Git Terminology

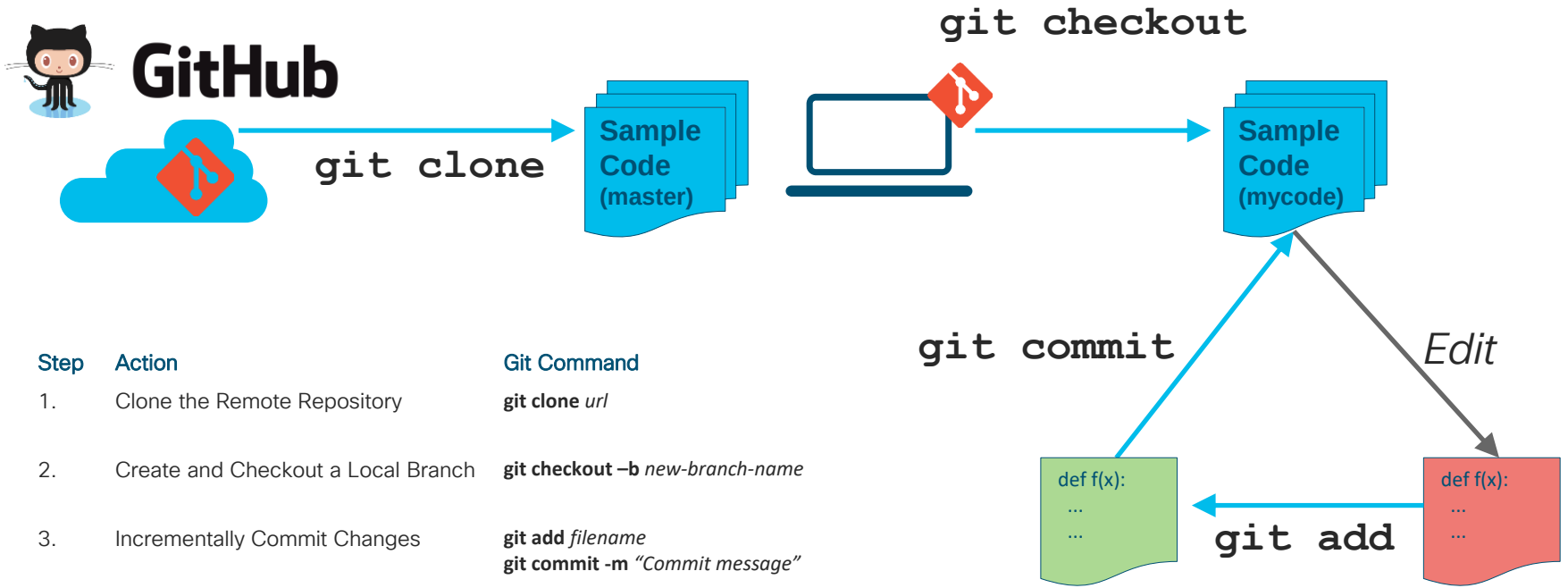
- **Repository (Repo)** – A vault for storing version controlled files
- **Working Directory** – The visible directory and its contents
- **Versioned Files** – Files you have asked Git to track
- **Un-Versioned Files** – Files in your working directory not tracked by Git
- **Commit** – Snapshot in time (of your version controlled files)
- **Branches** – A safe place for you to work

Useful Git Commands

Setup	Tell git who you are *one-time setup*	**git config --global user.name** *"your name"* **git config --global user.email** *your@email.com*
Clone	Clone ("download") a git repository	**git clone** *url*
Status	Check the Status of your local repository	**git status**
Checkout A Branch	Create and Checkout a local **Branch** Creates a "safe place" for your changes	**git checkout –b** *new-branch-name*
Add	Add a file to your next commit.	**git add** *filename*
Commit	Commit your changes.	**git commit –m** *"Your commit message."*
Checkout A File	Checks-out a file from the last commit. Reverts any changes you have made, and restores the last committed version of a file.	**git checkout** *filename*

Learn More: **git --help** and **man git**

DevNet Sample-Code Workflow



Step	Action	Git Command
1.	Clone the Remote Repository	**git clone** *url*
2.	Create and Checkout a Local Branch	**git checkout –b** *new-branch-name*
3.	Incrementally Commit Changes	**git add** *filename* **git commit -m** *"Commit message"*

A Peak Under the Hood

- **Commits** contain Trees
- **Trees** contain links to Files
- Git stores *full copies of all* ***Changed Files***

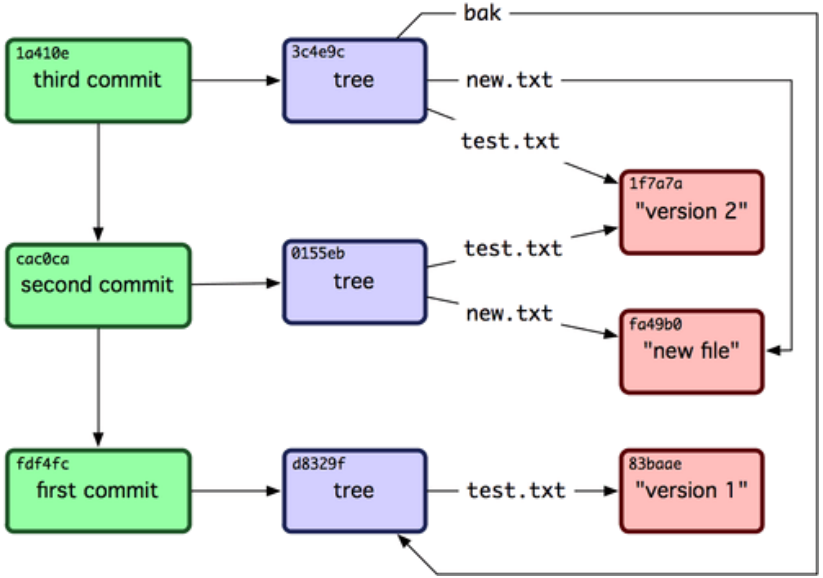
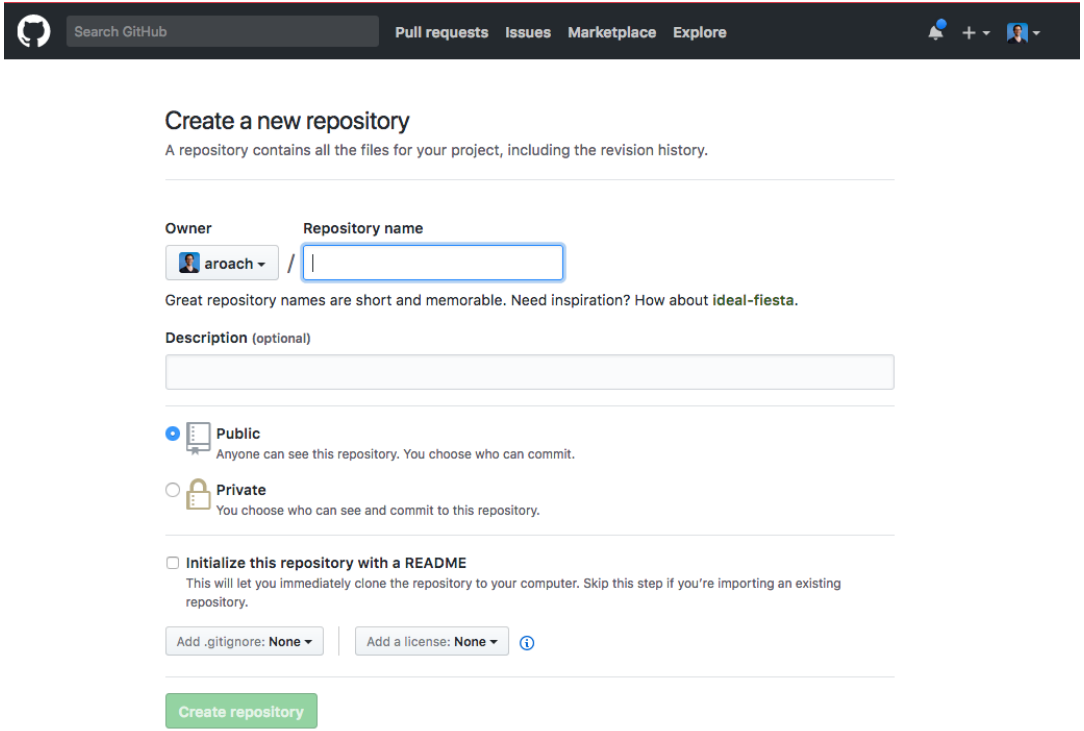


Image Source: http://git-scm.com

Getting Started with Git

Starting from GitHub (screnshot flow of new project)

Starting from your workstation (git init)



Getting Started with CLI: GIT CONFIG

- So you can be held accountable, configure git

```
$ git config --global user.name "Your Name Comes Here"
$ git config --global user.email you@yourdomain.example.com
```

Getting Started: Cloning Projects

- No password
- Set up SSH key on remote server (e.g. ssh-keygen)

```
$ git clone git@github.com:aroach/upgraded-guacamole.git
```

```
$ git clone https://github.com/aroach/upgraded-guacamole.git
```

Getting Started: Local Repository

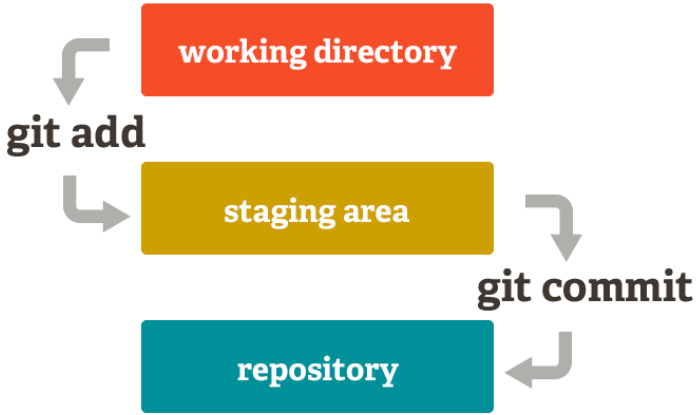
```
➜  demo-project git init
Initialized empty Git repository in /private/tmp/demo-project/.git/
➜  demo-project git:(master)
```

What's inside .git?

```
➜  demo-project git:(master) ls -l .git
total 24
-rw-r--r--   1 ashleyroach  wheel   23 Dec 22 10:38 HEAD
drwxr-xr-x   2 ashleyroach  wheel   64 Dec 22 10:38 branches
-rw-r--r--   1 ashleyroach  wheel  137 Dec 22 10:38 config
-rw-r--r--   1 ashleyroach  wheel   73 Dec 22 10:38 description
drwxr-xr-x  12 ashleyroach  wheel  384 Dec 22 10:38 hooks
drwxr-xr-x   3 ashleyroach  wheel   96 Dec 22 10:38 info
drwxr-xr-x   4 ashleyroach  wheel  128 Dec 22 10:38 objects
drwxr-xr-x   4 ashleyroach  wheel  128 Dec 22 10:38 refs
```

GIT ADD

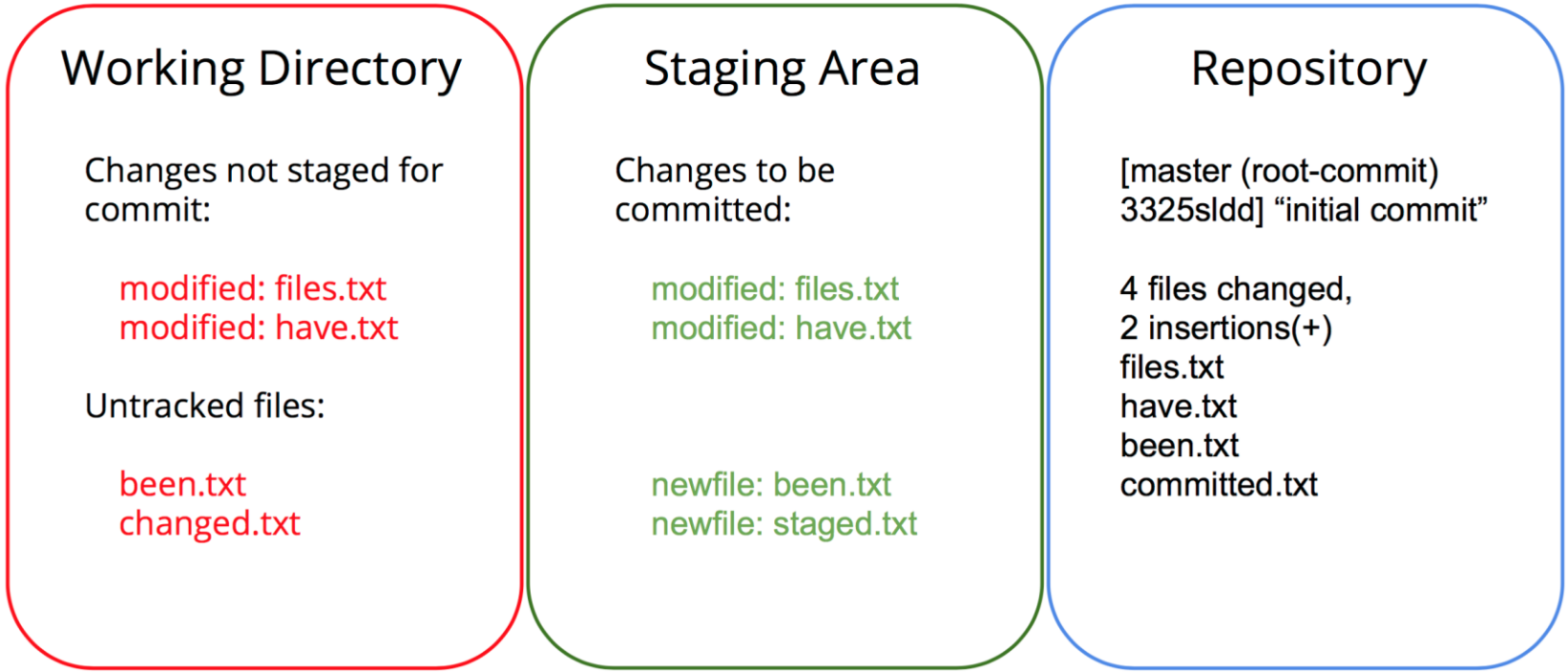
- Add any files in your repository to git “stage”



https://git-scm.com/images/about/index1@2x.png

```
$ git add .
```

STAGING AREA



GIT COMMIT

- Store your changes into a commit
- Saves all of your changes together / save point
- Commit does NOT push

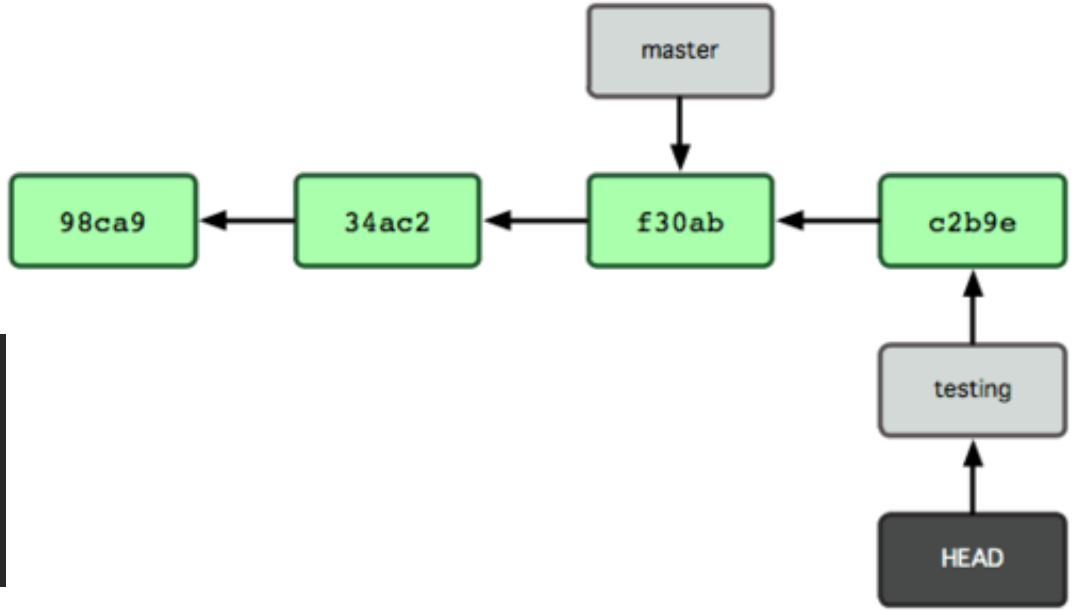
```
$ git commit –m ’Initial commit’
```

Git Log: History of commits

```
commit 37895108669192892df1056cae020131c775facc (HEAD -> master, github/master)
Author: Ashley Roach <asroach@cisco.com>
Date:   Thu Dec 7 16:47:54 2017 -0700

    remove proxy

commit 4c51b91c3fe974f9b929c64ad7cb2be7a7ae85e9 (origin/master, origin/HEAD)
Merge: fe54f3b 34987c1
Author: Ashley Roach <asroach@cisco.com>
Date:   Tue Feb 7 08:23:31 2017 -0700

    Merge branch 'master' of wwwin-github.cisco.com:DevNet/sandbox-devbox

commit fe54f3b3ef8e96ad09924bb7c46ae7eb29d55034
Author: Ashley Roach <asroach@cisco.com>
Date:   Tue Feb 7 08:19:49 2017 -0700

    Add License

commit 34987c15e4e2deefda9b9d5ae2730ef672a49358
Author: asroach <asroach@cisco.com>
Date:   Thu Jan 12 13:44:46 2017 -0700

    Add prereqs
```

BRANCHING: Your safe place

- Makes a pointer to your code
- Moves HEAD around




```
$ git branch <name>
$ git branch testing
$ git commit -m "new"
$ git checkout master
```

MERGING

- git merge <topic>
- You must be on the branch you want to merge INTO when you execute this command (e.g. master)

```
$ git merge <branch>
```

GOING BACKWARDS

- Generate a new commit that undoes all of the changes introduced in <commit>, then apply it to the current branch.

```
$ git revert <commit>
```

SHARE YOUR CHANGES

- git push <destination> <branch>
- git push origin master

```
$ git remote add <name> <url>
$ git push <name> <branch>
$ git push origin master
```

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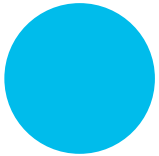
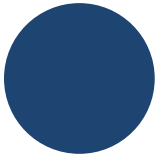
- Accent colors should only be used to call attention to important details, such as in a chart.

Hero



Cisco Blue
R 0
G 188
B 235



Midnight Blue
R 13
G 39
B 77

Green
R 116
G 191
B 75

Accent

Orange
R 251
G 171
B 24

Red
R 226
G 35
B 26

Exception

Ocean Blue*
R 30
G 68
B 113

* used for text on Cisco blue backgrounds

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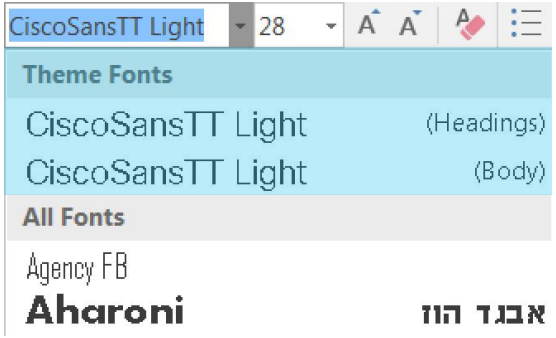

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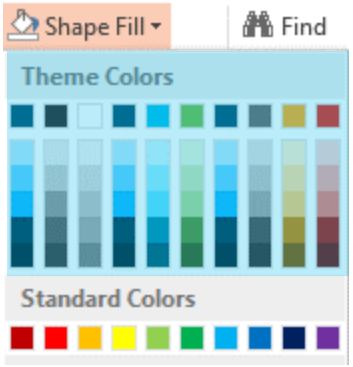

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  - Reset slides to the correct layout using Home/Layout (both PC and Mac).
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7. Tell them what to do next—get them to act


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