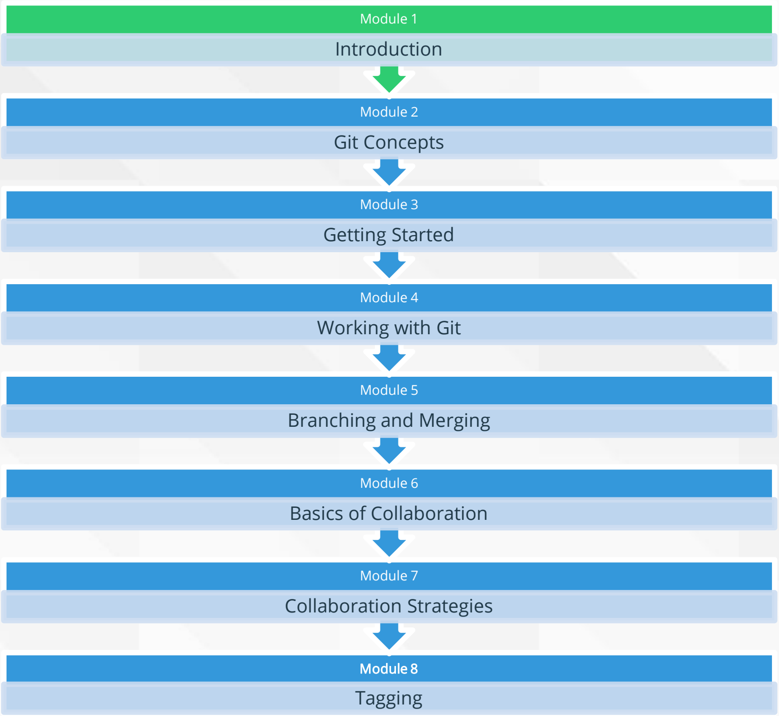
# Git Basics Course

# Introduction

- Welcome to the Git Basics Course
  - What is git?
  - Day to day usage
  - Managing development
  - Collaboration
  - Putting it all together
- No prior knowledge of Git is required

# Course Modules



Module 1
Introduction

Module 2
Git Concepts

Module 3
Getting Started

Module 4
Working with Git

Module 5
Branching and Merging

Module 6
Basics of Collaboration

Module 7
Collaboration Strategies

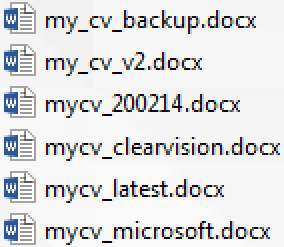
Module 8
Tagging

# Module 1 – Introduction

## The need for version control

# The Need For Version Control?

- What do you do, when you want to keep a backup of a file
  - You may want to avoid overwriting it (just in case)?



my_cv_backup.docx
my_cv_v2.docx
mycv_200214.docx
mycv_clearvision.docx
mycv_latest.docx
mycv_microsoft.docx

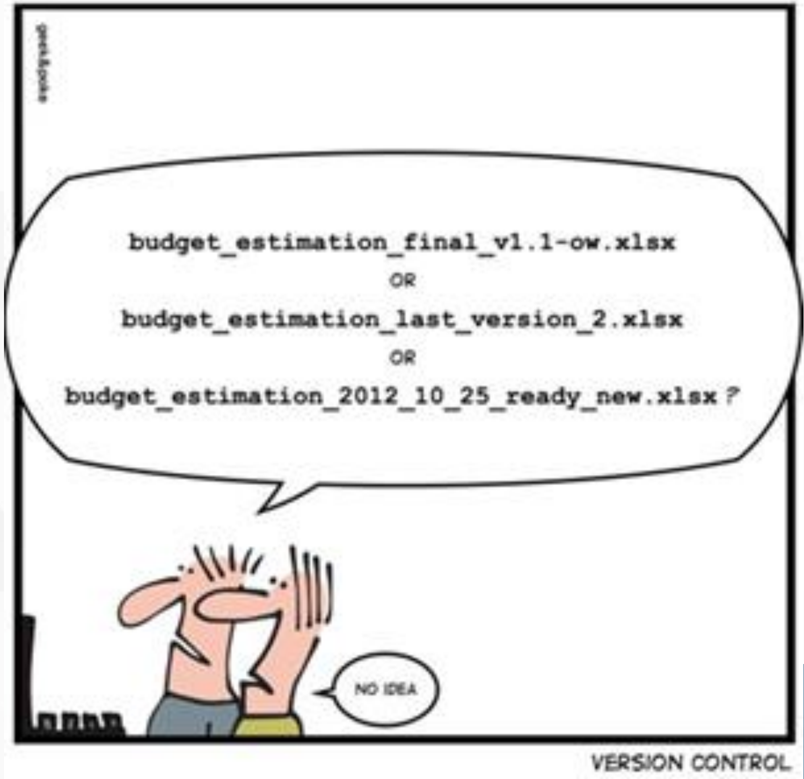
- Which of these cvs is the latest version?

# The Need For Version Control?

- Imagine many collaborators, all treating files this way.

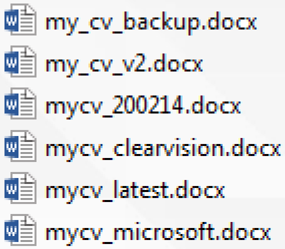
- How do others know which one to use?

- What if you are working on code? Will older versions compile / build?

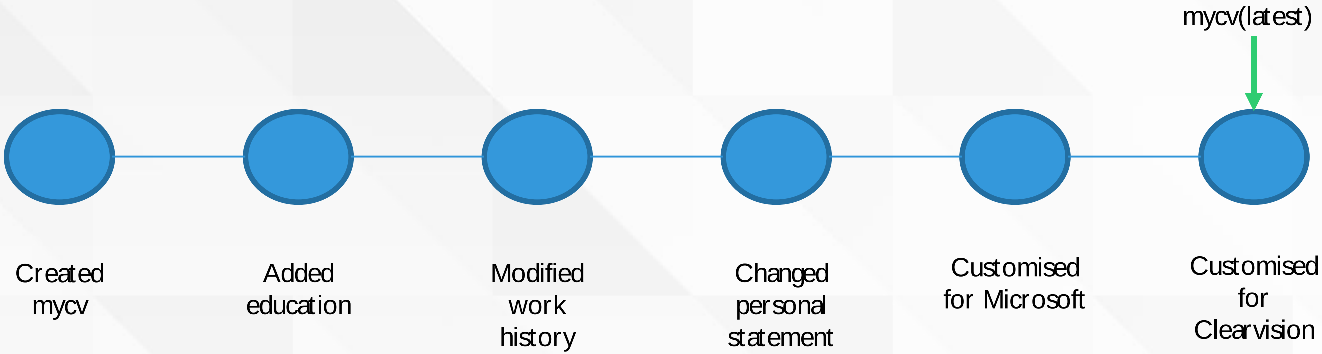

geek&poke
budget_estimation_final_v1.1-ow.xlsx
OR
budget_estimation_last_version_2.xlsx
OR
budget_estimation_2012_10_25_ready_new.xlsx ?
NO IDEA
VERSION CONTROL

# The Need For Version Control?

- Wouldn’t it be better if we could identify the order these versions were created? And why?
- An entirely different view is possible…



my_cv_backup.docx
my_cv_v2.docx
mycv_200214.docx
mycv_clearvision.docx
mycv_latest.docx
mycv_microsoft.docx



mycv(latest)

Created mycv

Added education

Modified work history

Changed personal statement

Customised for Microsoft

Customised for Clearvision

# The history of Git and what it’s all about

Activity – Hit or Myth

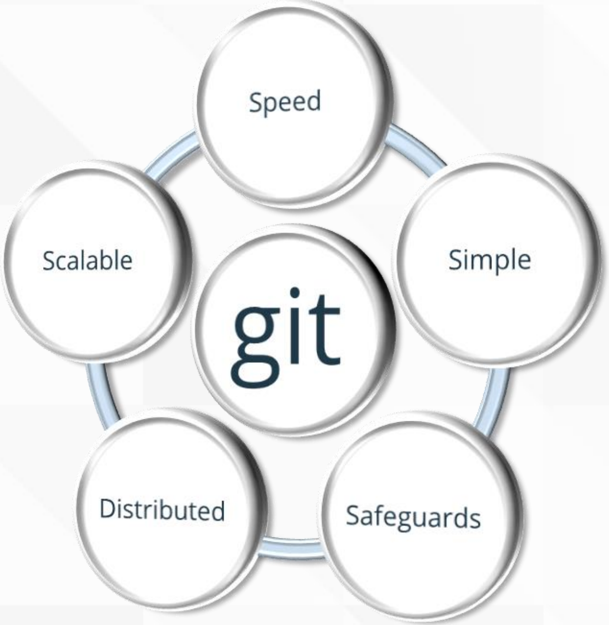
# What is Git? – History

- Developed by Linus Torvalds (the founder of Linux)
- Began life as a selection of Perl scripts
- Created for use on the Linux kernal project

Linus Torvalds 2002

# What is Git? – History

- Development started April 2005
- First official release later the same month
- Followed less than a month later by the first Linux kernel release utilising Git for version control
- The Linux project had a number of requirements

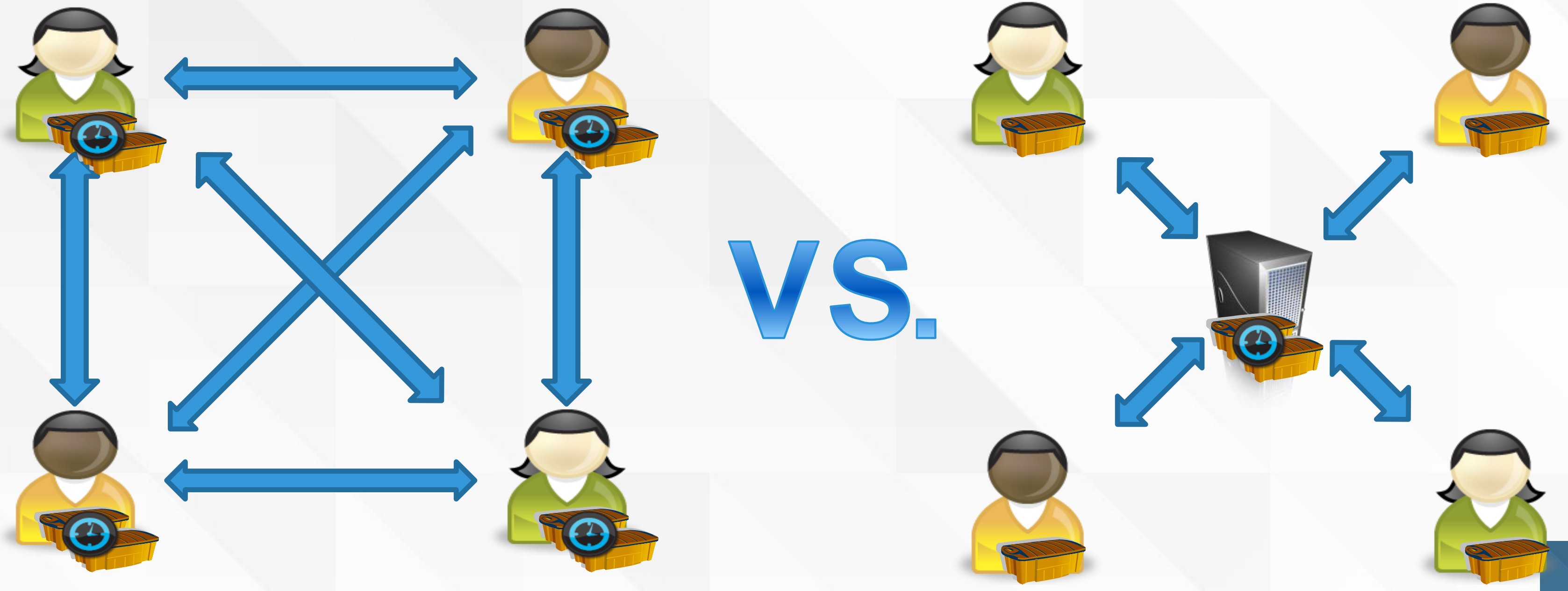


# What is Git? – DVCS

- Distributed Version Control System (DVCS)
  - Complete copy of all project artefacts locally
  - A locally available server and client
  - Ability to collaborate through any network connection
- Centralised Version Control System (CVCS)
  - Local Copy of project artefacts of a specific version
  - Local client, remote server
  - Collaboration must go through central storage.

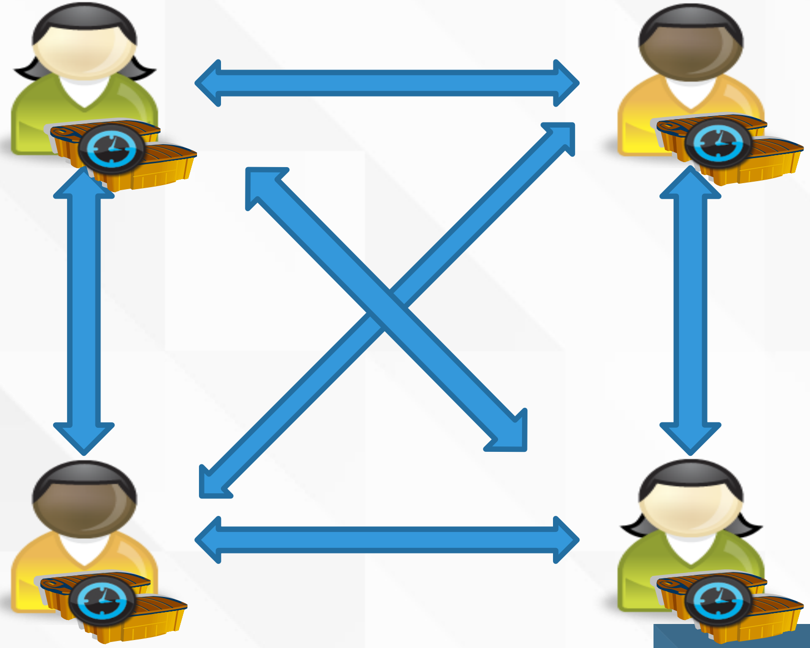
# What is Git? – DVCS

- Distributed Version Control System (DVCS)



# What is Git? – DVCS Advantages

- Developers can work independently
  - And more productively
- Allows for easy ‘draft’ coding
- Distributed nature avoids single points of failure
  - Implicit ‘backup’



# What is Git? – Disadvantages

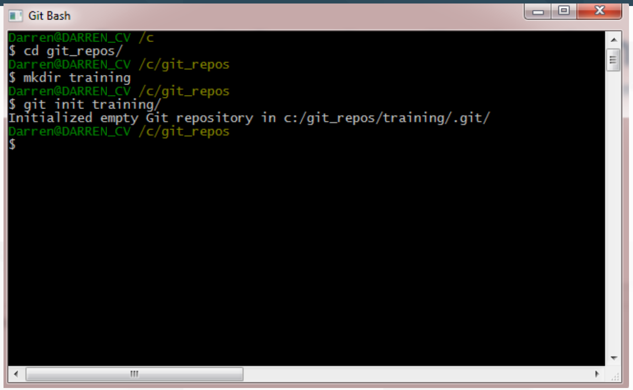
- Lack of controls
- Due to the entire history being included, the size of data to be copied to initialise can be large
- Both can be mitigated
  - Various security options
  - Compression (packing)
- And do not pose a significant barrier to DVCS

# Git Design

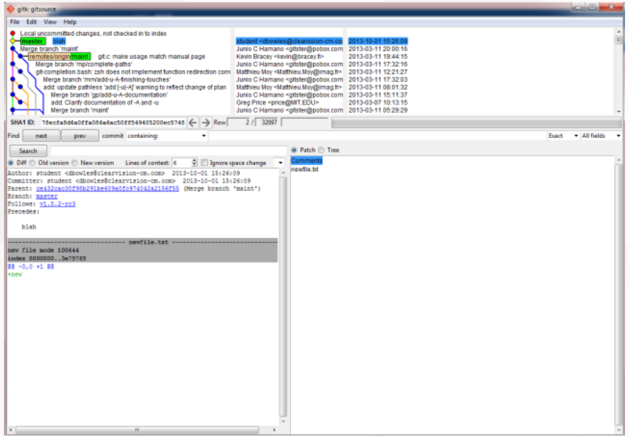
A brief summary of its make up and Gits terminology

# Git Design – Some basics

- A command line tool (Plumbing)
- Easy for developers to use
- Graphical options exist (Porcelain)
- Usually preferred by Windows users



```
Darren@DARREN_CV /c
$ cd git_repos/
Darren@DARREN_CV /c/git_repos
$ mkdir training
Darren@DARREN_CV /c/git_repos
$ git init training/
Initialized empty Git repository in c:/git_repos/training/.git/
Darren@DARREN_CV /c/git_repos
$
```

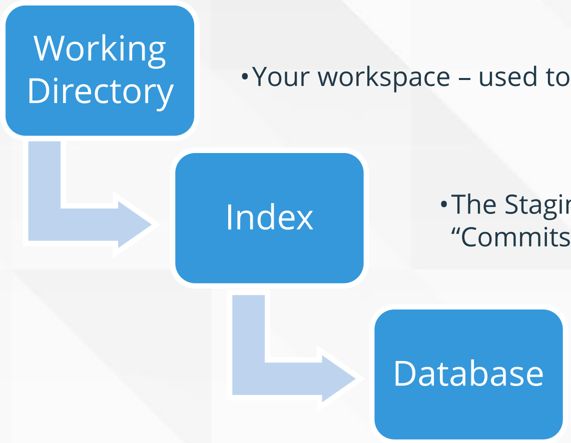


```
Local uncommitted changes, not checked in to index
blah                                                          student <dbowles@clearvision-cm.co   2013-10-01 15:26:09
Merge branch 'maint'                                          Junio C Hamano <gitster@pobox.com    2013-03-11 20:00:16
git.c: make usage match manual page                           Kevin Bracey <kevin@bracey.fi>       2013-03-11 19:44:15
Merge branch 'mp/complete-paths'                              Junio C Hamano <gitster@pobox.com    2013-03-11 17:32:16
git-completion.bash: zsh does not implement function redirection com  Matthieu Moy <Matthieu.Moy@imag.fr>  2013-03-11 12:21:27
Merge branch 'mm/add-u-A-finishing-touches'                   Junio C Hamano <gitster@pobox.com    2013-03-11 17:32:03
add: update pathless 'add [-u|-A]' warning to reflect change of plan  Matthieu Moy <Matthieu.Moy@imag.fr>  2013-03-11 08:01:32
Merge branch 'gp/add-u-A-documentation'                       Junio C Hamano <gitster@pobox.com    2013-03-11 15:11:37
add: Clarify documentation of -A and -u                       Greg Price <price@MIT.EDU>           2013-03-07 10:13:15
Merge branch 'maint'                                          Junio C Hamano <gitster@pobox.com    2013-03-11 05:29:29

SHA1 ID: 78ecfa8d6a0ffa086a6ac50ff549405200ec5748   Row 2 / 32097
Lines of context: 6

Author: student <dbowles@clearvision-cm.com>  2013-10-01 15:26:09
Committer: student <dbowles@clearvision-cm.com>  2013-10-01 15:26:09
Parent: ce432cac30f98b291be609a0fc974042a2156f55 (Merge branch 'maint')
Branch: master
Follows: v1.8.2-rc3
Precedes:

    blah

------------------------------ newfile.txt ------------------------------
new file mode 100644
index 0000000..3e75765
@@ -0,0 +1 @@
+new
```

```
newfile.txt
```

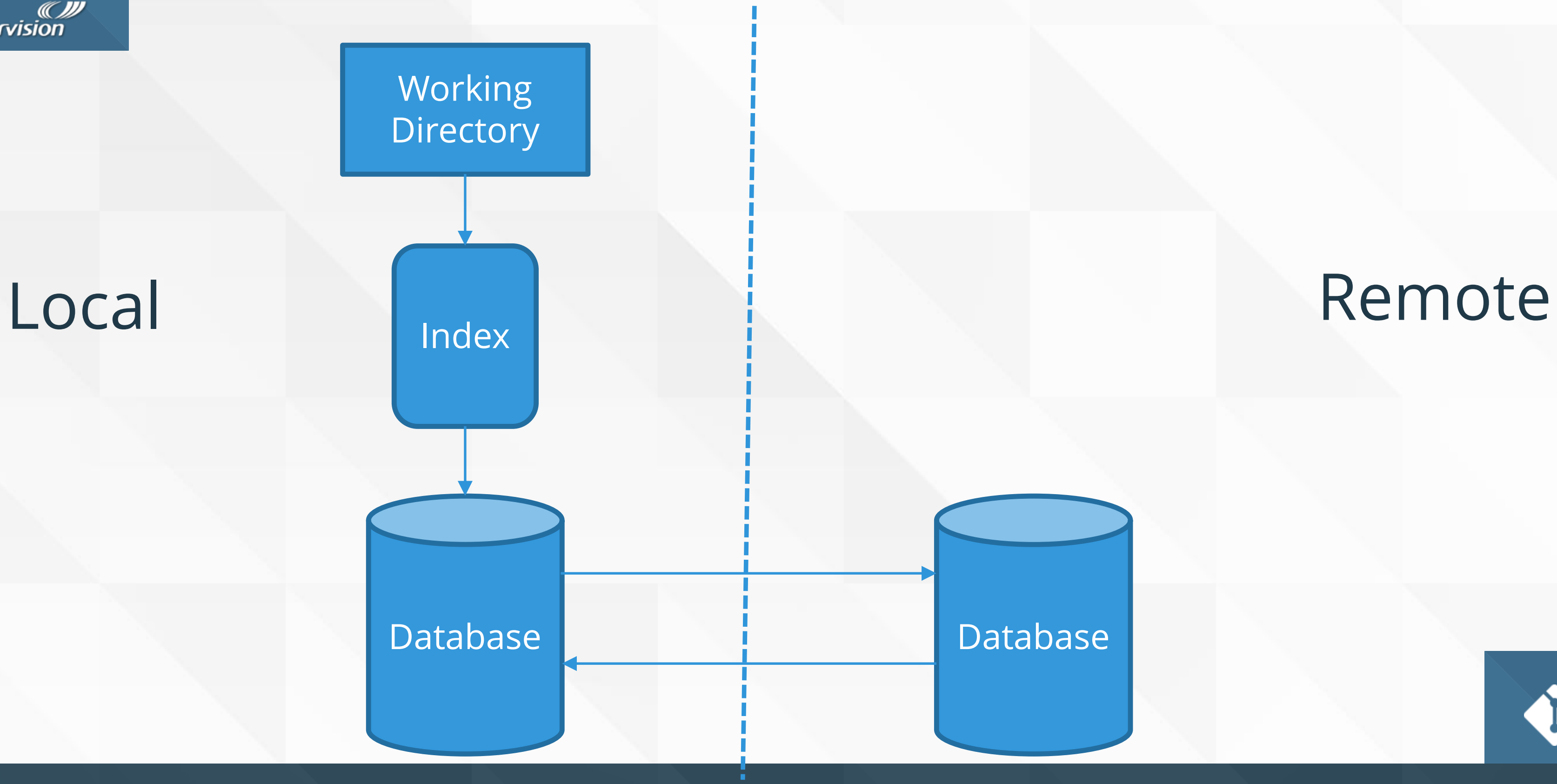
# Git Design – Repositories

- Often abbreviated to “repo”
- A container for a versioned project including all of its resources and associated historical changes
- Consists of :



- Your workspace – used to make all changes
- The Staging Area – used to build up “Commits”
- All versioned data and history

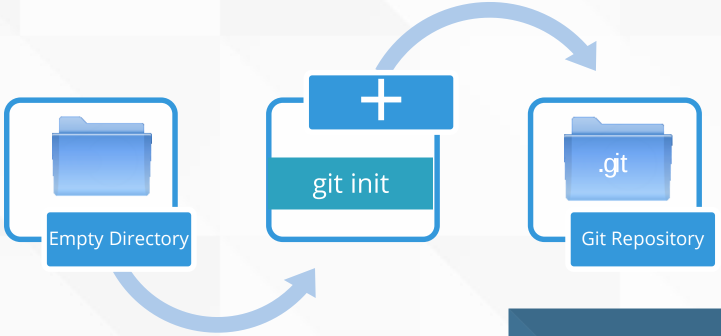
# Git Design – Repositories



# Git Design – Getting Started

- To start using Git you have two options
  - Create an empty local repository
  - “Clone” an existing remote repository.
- The result will take an empty directory and turn it into a Git repository

– This is denoted by the presence of a “.git” directory



# Lab Exercise

- ‘Version Control Comparison’
- Complete the ‘setup git’ lab instructions

# End of Module