Crash course in revision control
Or, how to never lose work again

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April 24, 2012

Introduction

What we are going to cover today:

1. Why do we all use revision control?
2. What is revision control?
3. Git

Who here has lost work?

Who here has never lost work?

Why do we use revision control?

Figure: Not using revision control is always a bad choice

Why do we use revision control?

Figure: This is what happens when you use Revision Control

The number one rule for revision control?

Use It!

What is revision control?

- More commonly known as "Source Control Management" (SCM)
- What does a SCM do:
  - Keep track of files creation/deletion, changes over time
  - Backup to offsite store
- Two major types:
  - Centralised SCM
    - Server: The Repository
    - Client: Local changes
  - Decentralised SCM
    - Anyone can be the server
    - Complete history
    - Offline usage

Just remember, you have everything locally

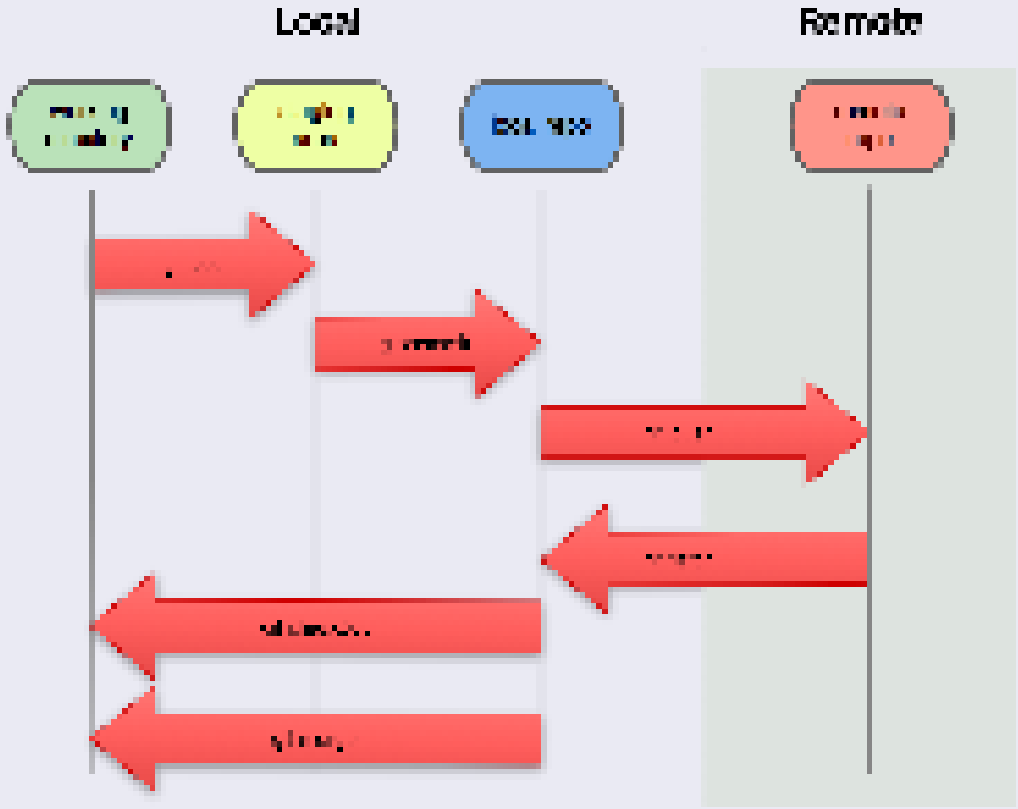


Figure: Git has several layers allowing for complete control[1]

[1] Image from http://whygitisbetterthanx.com/

Under the hood?

Google it!

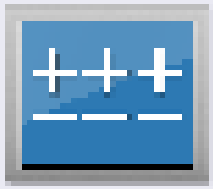
It can get pretty advanced pretty quickly

Tools

Client-side

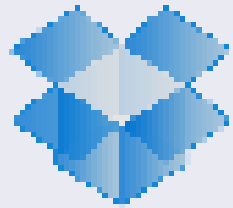
- git
- git-svn

Applications



gitx

GitHub for Mac



Dropbox

Online

BitBucket

GitHub

Google

Google Code

Time to rock and roll

Lets get it started...

Time for you guys to join in! Steps to follow:

1. Have a computer with git OR ssh into linuxproj
2. Have a GitHub account

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To GitHub!

Lets start simple and start a project on GitHub

Git init

Git init, or, where do baby repositories come from

In a nutshell, you use git init to make an existing directory of content into a new Git repository. You can do this in any directory at any time, completely locally.

```
$ git config --global user.name 'Phillip Whittlesea'
$ git config --global user.email pw6g08@ecs.soton.ac.uk

$ mkdir learngit
$ cd learngit
$ git init
```

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To the command line!

Creating our repository

Git status

Git status, or, 'Hey Git whats happening?'

In a nutshell, you run git status to see if anything has been modified since your last commit so you can decide if you want to commit.

```
$ touch README
$ git status
# On branch master
#
# Initial commit
#
# Untracked files:
#   (use "git add <file>..." to include in what...
#
#   README
```

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To the command line!

Finding out what Git knows

Git add

Git add, or, what to do if you like your changes

In a nutshell, you run git add on a file when you want to include whatever changes you've made to it in your next commit.

```
$ git add README
$ git status
# On branch master
#
# Initial commit
#
# Changes to be committed:
#   (use "git rm --cached <file>..." to unstage)
#
#   new file:   README
#
```

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```

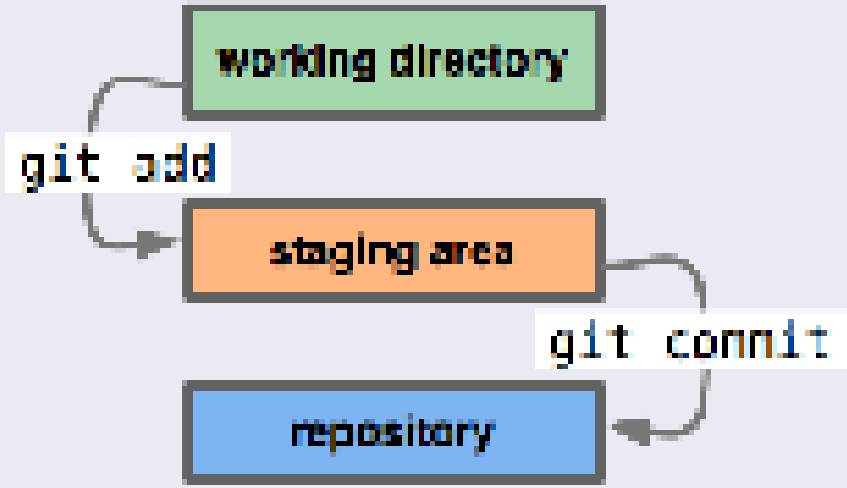
To the command line!

Telling Git what to remember

The Staging Area

Stop the press, what is a staging area?!

In a nutshell, think of the staging area as a loading dock before your truckload of code heads off to Commitsville[a].



[a] Image from http://whygitisbetterthanx.com/

Git commit

Git commit, or, lets keep that as its kinda important

In a nutshell, you run git commit to record the snapshot of your staged content. This snapshot can then be compared, shared and reverted to if you need to.

```
$ git commit -m 'first commit'
[master (root-commit) ddf46d4] first commit
 0 files changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 README
$ git status
# On branch master
nothing to commit (working directory clean)
```

Git commit

Commit messages

What I care about:

- Features you have implemented
- Bugs you have fixed
- Purpose of the commit
- Related tickets

What I DONT care about:

- If you're going to lunch

How frequently do I commit?

Commit little, stable code often!

Git commit

Commit messages

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What I DONT care about:

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To the command line!

Telling Git that you REALLY want this

Git remote

Git remote, or, where did I leave that repository?

In a nutshell, with git remote you can list remote repositories. Use git remote add to add new remotes and git remote rm to delete existing ones.

```
$ git remote add origin \
  git@github.com:pwhittlesea/learngit.git
```

Git push

Git push, or, sharing is caring!

In a nutshell, you run git push to update a remote repository with the changes you've made locally.

```
$ git push -u origin master
Counting objects: 3, done.
Writing objects: 100% (3/3), 213 bytes, done.
Total 3 (delta 0), reused 0 (delta 0)
To git@github.com:pwhittlesea/learngit.git
 * [new branch]      master -> master
Branch master set up to track remote branch master
 from origin.
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To the command line!

Deploying local code to a remote location

Git pull / fetch + merge; bring it back now y'all!

Git fetch + merge

Git fetch, will pull changes from the remote to the local repo.
Git merge, will merge a branch into the current context.

OR

Git pull

In a nutshell, you run git pull to take the latest changes from the remote repository.

tl;dr; What we've covered...

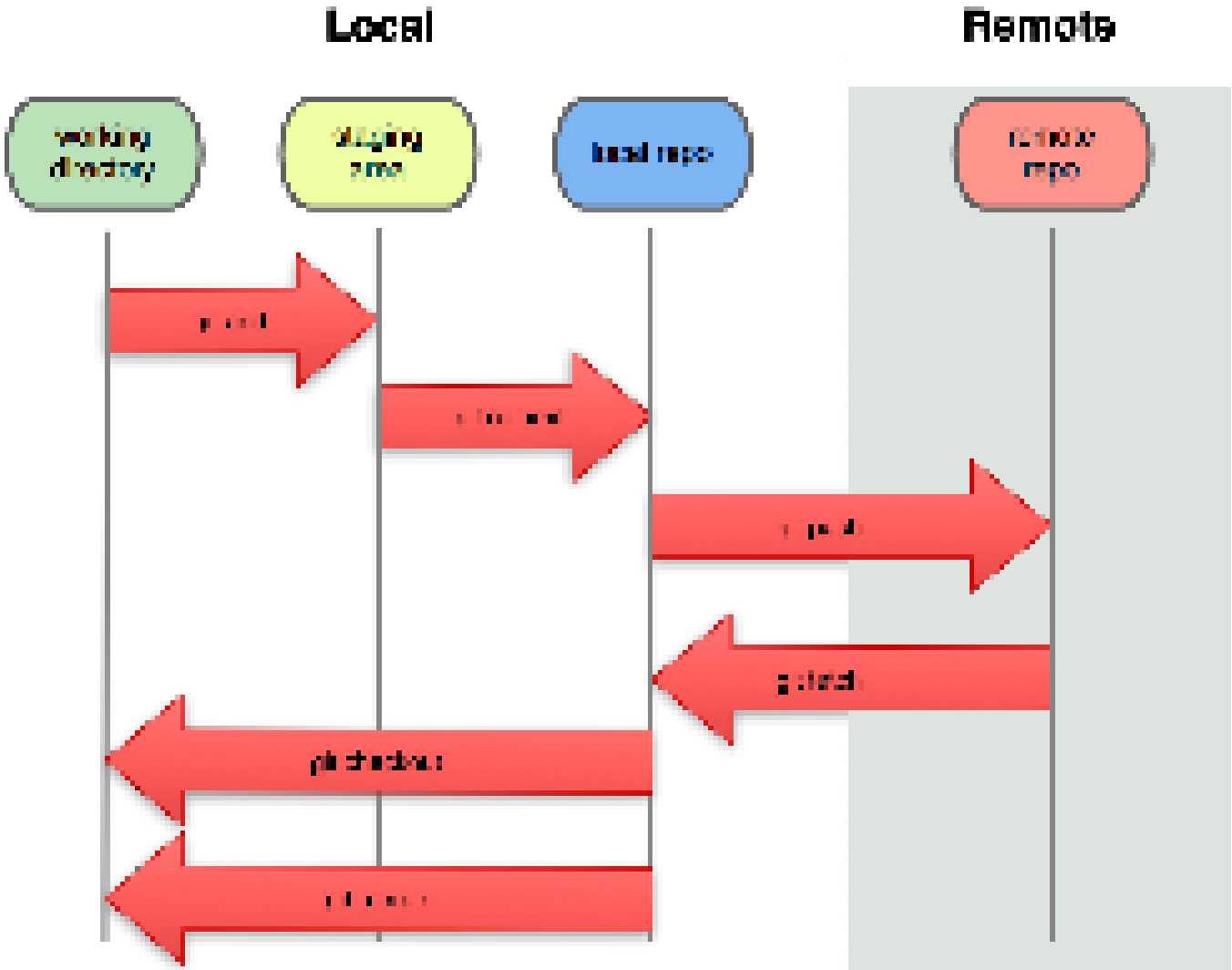

Figure: Don't forget git pull!

Git Branch, or, programming your bit on the side!

In a nutshell, you use git branch to list your current branches, create new branches and delete unnecessary or already merged branches.

Figure: A single git repository can maintain multiple branches of development.

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To the command line!

Creating a branch for some simple changes

Other matters...

Git ignore

Ignore those files we dont care about

Git clone

Checkout a remote repository into the local folder

Stuff gone wrong?

```
git reset --HARD
```