USING GIT ON OS-X

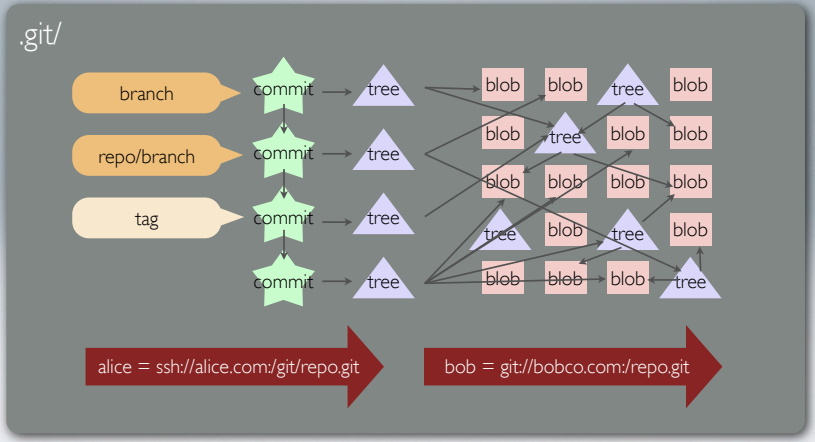
Munich Cocoaheads 2009-11-12

COMING UP

- Basic Concepts
- Daily Git
- Git with XCode
- ~~Non-Obvious Git~~

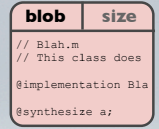
WHAT IS GIT?

WHAT IS GIT?

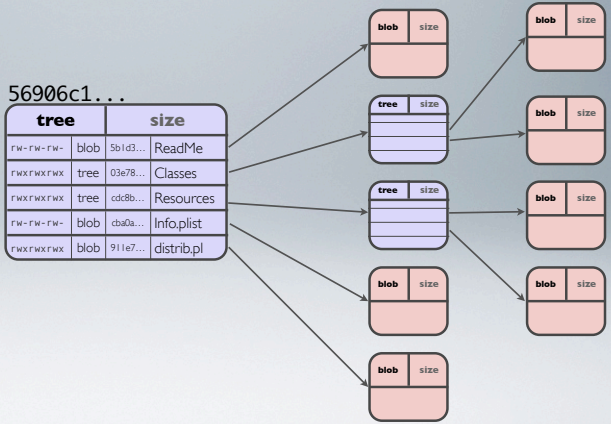

.git/
branch
repo/branch
tag
commit
commit
commit
commit
tree
tree
tree
tree
blob
blob
tree
blob
blob
tree
blob
blob
blob
blob
blob
blob
blob
tree
tree
blob
tree
blob
blob
blob
blob
tree
alice = ssh://alice.com:/git/repo.git
bob = git://bobco.com:/repo.git

BLOBS

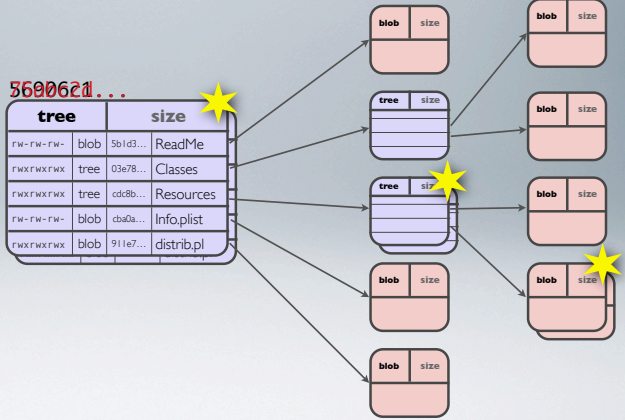
SHA1 5e4c1725109d441fe846300fd4e57063cc6d6b



TREES


56906c1...
tree
size
rw-rw-rw-
blob
5b1d3...
ReadMe
rwxrwxrwx
tree
03e78...
Classes
rwxrwxrwx
tree
cdc8b...
Resources
rw-rw-rw-
blob
cba0a...
Info.plist
rwxrwxrwx
blob
911e7...
distrib.pl
blob
size
tree
size
tree
size
blob
size
blob
size
blob
size
blob
size
blob
size
blob
size

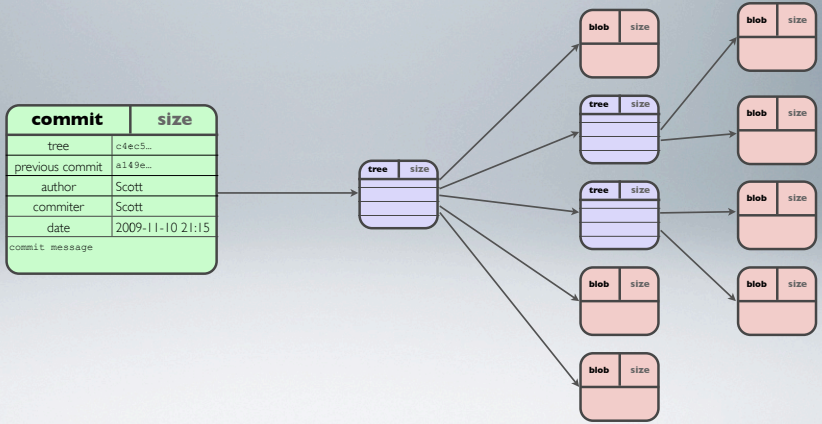
CHANGES


560062d...
tree
size
rw-rw-rw- blob 5b1d3... ReadMe
rwxrwxrwx tree 03e78... Classes
rwxrwxrwx tree cdc8b... Resources
rw-rw-rw- blob cba0a... Info.plist
rwxrwxrwx blob 911e7... distrib.pl
blob
size
tree
size

COMMITS

56906c1...

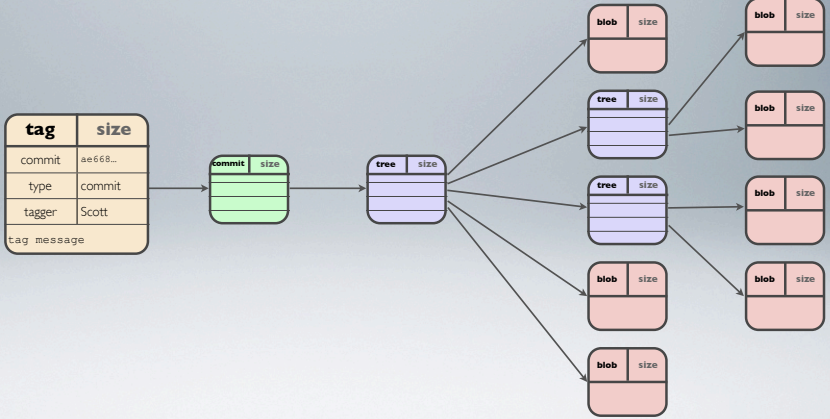
COMMITS


commit
size
tree
c4ec5…
previous commit
a149e…
author
Scott
commiter
Scott
date
2009-11-10 21:15
commit message
tree
size
blob
size
tree
size
tree
size
blob
size
blob
size
blob
size
blob
size
blob
size
blob
size

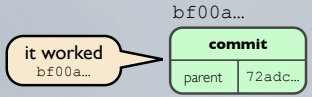
TAGS


56906c1...
tag
size
commit
ae668…
type
commit
tagger
Scott
tag message

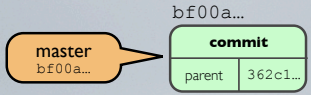
TAGS


tag
size
commit
ae668...
type
commit
tagger
Scott
tag message
commit
size
tree
size
blob
size
tree
size
tree
size
blob
size
blob
size
blob
size
blob
size
blob
size
blob
size

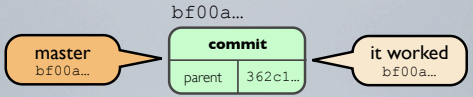
LIGHT-WEIGHT TAGS



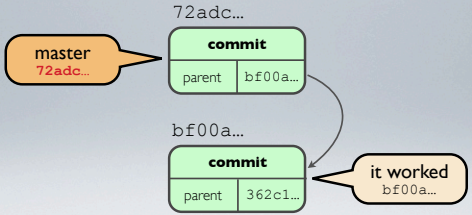
BRANCHES



BRANCHES 'V' TAGS

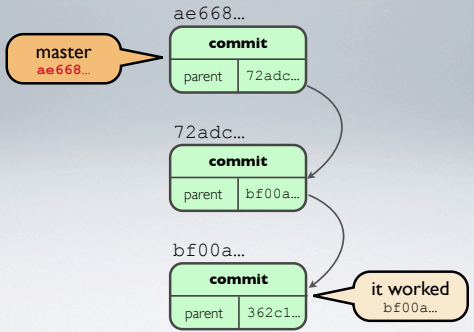


BRANCHES 'V' TAGS



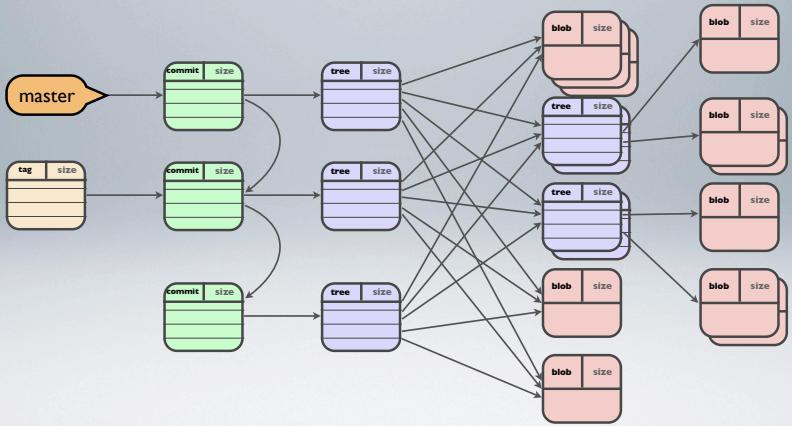
BRANCHES 'V' TAGS

HEAD and your current branch are automatically updated when you commit a change.

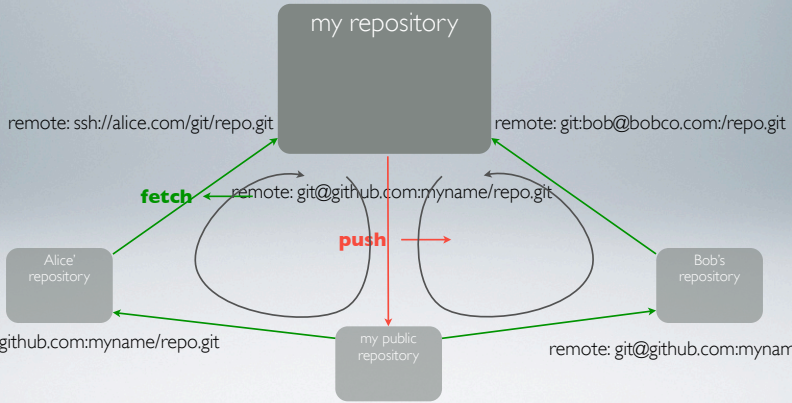


tags are immutable and reliably point to a known state of the entire repository

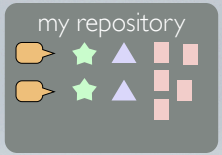
THE WHOLE LOT



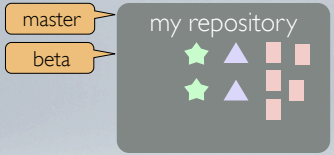
SHARING

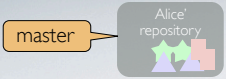

my repository
remote: ssh://alice.com/git/repo.git
remote: git:bob@bobco.com:/repo.git
fetch
remote: git@github.com:myname/repo.git
push
Alice' repository
Bob's repository
remote: git@github.com:myname/repo.git
my public repository
remote: git@github.com:myname/repo.git

NAMESPACES



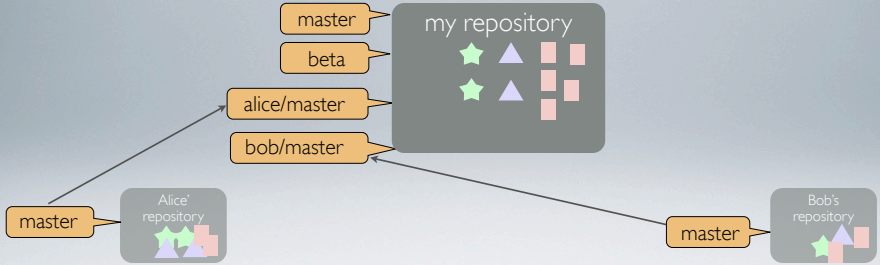
NAMESPACES


master
beta
my repository

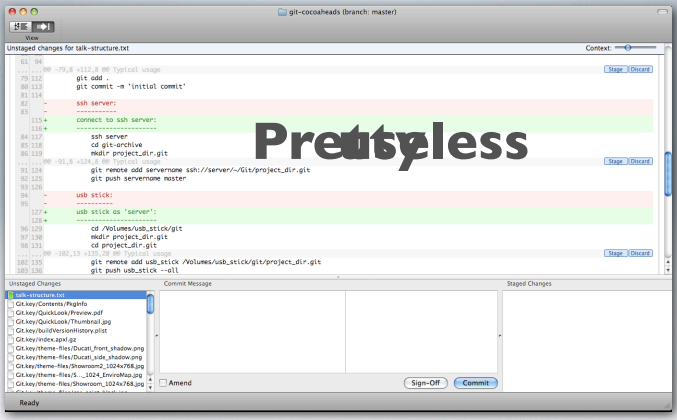

master
Alice'
repository


master
Bob's
repository

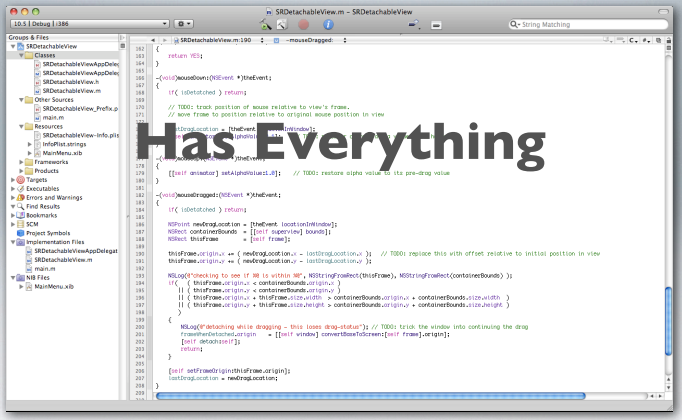
NAMESPACES


master
beta
alice/master
bob/master
my repository
master
Alice'
repository
master
Bob's
repository

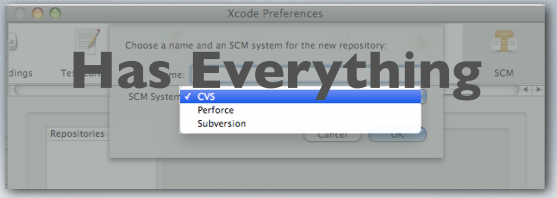
GITX


git-cocoaheads (branch: master)
Unstaged changes for talk-structure.txt
Context:
Stage
Discard
Unstaged Changes
Commit Message
Staged Changes
talk-structure.txt
Amend
Sign-Off
Commit
Ready

XCODE

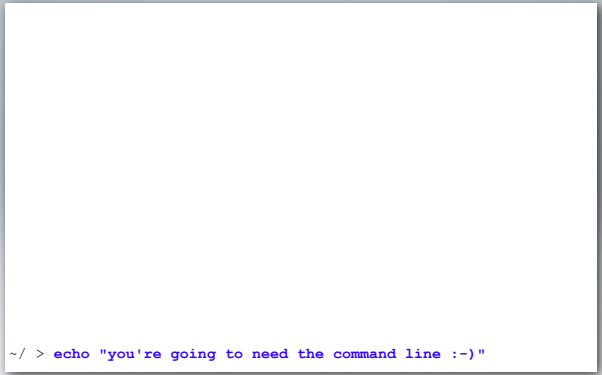

SRDetachableView.m – SRDetachableView
10.5 | Debug | i386
String Matching
Groups & Files
SRDetachableView
Classes
SRDetachableViewAppDeleg
SRDetachableViewAppDeleg
SRDetachableView.h
SRDetachableView.m
Other Sources
SRDetachableView_Prefix.p
main.m
Resources
SRDetachableView-Info.pli
InfoPlist.strings
MainMenu.xib
Frameworks
Products
Targets
Executables
Errors and Warnings
Find Results
Bookmarks
SCM
Project Symbols
Implementation Files
SRDetachableViewAppDelegat
SRDetachableView.m
main.m
NIB Files
MainMenu.xib
SRDetachableView.m:190
-mouseDragged:
Has Everything

XCODE



Has Everything

GIT YOUR HANDS DIRTY



FIRST STEPS

GLOBAL CONFIGURATION

```
~/ > $EDITOR ~/.gitconfig

[core]
     pager = more
     excludesfile = /Users/me/.gitignore
[user]
     name = My Full Public Identity
     email = h4x0r@example.com
[format]
     pretty = format:%h %ci [%aN] %s
```

pager stops long lists from flying past your nose uncontrollably

excludesfile specifies files should never be checked into a git repository

format:

- %h = hash id
- %ci = commit date, iso 8601 format
- %aN = author name
- %s = summary

more info: `git log --help`

GLOBAL CONFIGURATION

```
~/ > $EDITOR ~/.gitignore

# apple typical files
.DS_Store
.Spotlight-V100
.com.apple.timemachine.supported
.fseventsdbuild

# XCode user state files
*.mode1v3
*.pbxuser
*.objc_sync

# other SCM systems
.svn

# editor temporary files
*~
*.swp

# files you generate while building
build/
version.txt
CHANGELOG
```

WHERE TO LOOK FOR HELP

```
~/ > git help <cmd>
```

```
~/ > git <cmd> --help
```

make sure you install git's man-pages.

Use the `man` branch of the git repository

WHERE TO LOOK FOR HELP

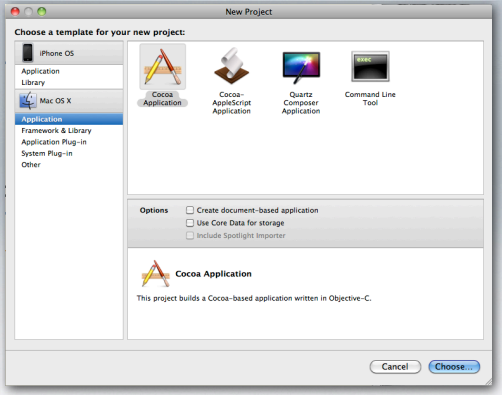
http://git-scm.com

http://github.com

http://gitready.com

http://google.com

A NEW PROJECT



NEW PROJECT IN GIT

```
~/>            cd project


~/project/ >   git init
Initialized empty Git repository in project_dir/.git/


~/project/ >   git add .


~/project/ >   git commit -m 'initial commit'
[master (root-commit) 64fb323] initial commit
 1 files changed, 1 insertions(+), 0 deletions(-)
 create mode 100644 hello.txt
```

create your project in XCode
create a new git repository
add your files & directories to git
commit your changes

GIT CONFIGURATION FOR XCODE

```
~/project/ >  $EDITOR .gitattributes


*.pbxproj -crlf -diff -merge
*.nib     -crlf -diff -merge
*.xib     -crlf -diff -merge
*.graffle -crlf -diff -merge


~/project/ >  git add .gitattributes


~/project/ >  git commit -m 'add .gitattributes - prevent accidental merging of special XCode files'
[master (root-commit) 64fb323] initial commit
 1 files changed, 1 insertions(+), 0 deletions(-)
 create mode 100644 .gitattributes
```

Tell git to treat these files as if they were binaries.

XML files are notorious for being text, but "unmergable".

`.gitattributes` is project-specific
must be checked into each project seperately
will automatically be used by all project members

JOINING AN EXISTING PROJECT

```
~/ > git clone -o cloned_repo URL/project.git

~/ > cd project

~/project/ > git checkout -b my_stuff cloned_repo/master
```

cloning a repository automatically sets up a remote repository called `origin`.

You can specify a different name for the remote repository with `-o name`

CLONE A LOCAL REPOSITORY

```
~/ > git clone ~/old_project_dir ~/new_project_dir
```

cloning a repository automatically sets up a remote repository called `origin`.

You can specify a different name for the remote repository with `-o name`

DAILY WORK

ADD & COMMIT

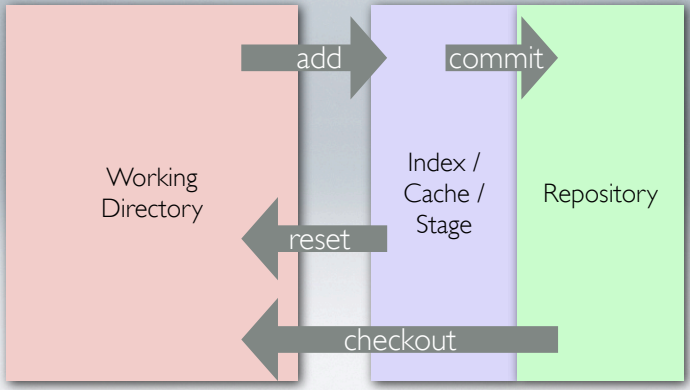
work work work…

```
~/project/ > git status

~/project/ > git add file file file directory…  or git add -A  or git add -u

~/project/ > git status

~/project/ > git commit -m 'what I just did'
```

git add -A
- new files
- changed files
- removed files

git add -u
- changed files
- removed files

WHY ADD & COMMIT?



COMMIT (WITHOUT ADD)

```
~/project/ > git commit -a -m 'what I just did'
```

git commit -a
same as
git add -A; git commit

BRANCHING

```
~/project/ > git checkout -b new_branch

~/project/ > git branch -a

~/project/ > git branch -d old_branch

~/project/ > git branch -D old_branch
```

TIP: you can create a new branch AFTER you have already made changes.

Just `checout -b new_branch` before you `git add`

DIFFERENCES?

```
~/project/ > git diff

~/project/ > git diff --cached

~/project/ > git diff HEAD

~/project/ > git diff branch
```

MERGING

```
~/project/ > git merge other_branch
```

fix conflicts…

```
~/project/ > git add -A
```

```
~/project/ > git commit -m 'merge changes from other_branch'
```

git always merges into the working directory

merged files are added automatically

conflicts are not added - you need to resolve them first

THROWING THINGS AWAY

`git reset --hard` updates the cache and the working tree to match the named branch (by default `HEAD`)

```
~/project/ > git reset

~/project/ > git reset --hard HEAD
```

MULTIPLE REPOSITORIES

PUBLISHING YOUR REPOSITORY

```
local ~/project/ >          ssh me@remote.com

remote ~/ >                 mkdir project.git

remote ~/project.git/ >     cd project.git

remote ~/project.git/ >     git init --bare

remote ~/project.git/ >     logout

local ~/project/ >          git remote add public_repo ssh://me@remote.com/~/project.git

local ~/project/ >          git push public_repo release_branch
```

you should NOT publish your private directories (basic security)

create a `bare repository` on a public server

push only the branches your wish to publish

USB-STICK

```
~/project/ > git clone --bare . /Volumes/usb_stick/project.git

~/project/ > git remote add usb_stick /Volumes/usb_stick/project.git

~/project/ > git push usb_stick
```

USB stick, external disk

great for ad-hoc sharing

great for backup

treat like a public repository

REALLY QUICK SHARING

```
~/project/ > cp -R . /Volumes/usb_stick/project

~/project/ > git remote add usb_stick /Volumes/usb_stick/project

~/project/ > git push usb_stick
```

copying a repository works just fine - both copies can synchronise with each other!

WHICH REPOS AM I CONNECTED TO?

```
~/project_dir/ > git remote -v

public_repo    ssh://me@remote.com/~/project.git (fetch)
public_repo    ssh://me@remote.com/~/project.git (push)
usb_stick      /Volumes/usb_stick/project.git (fetch)
usb_stick      /Volumes/usb_stick/project.git (push)
```

UPDATES FROM MULTIPLE REPOS

```
~/project/ > $EDITOR .git/config

...
[remote "steve"]
        url = ssh://steveserve.com/~/Git/project.git
        fetch = +refs/heads/*:refs/remotes/steve/*
[remote "mac"]
        url = git@github.com:mac/project.git
        fetch = +refs/heads/*:refs/remotes/mac/*
[remotes]
        buddies = steve mac
...

~/project/ > git remote update buddies
Updating steve
...
Updating mac
...
```

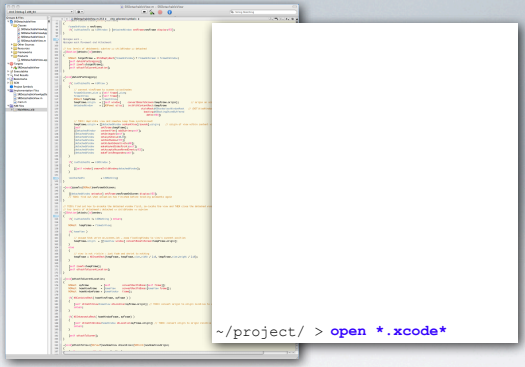
WORKING WITH OTHERS

Publish your changes via a bare repository

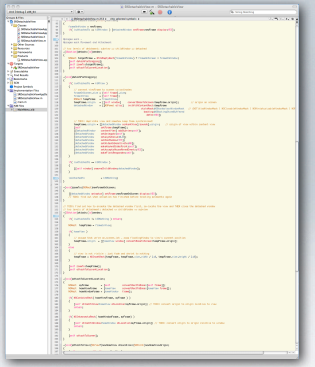
Never push to someone else's repository

Use `git remote update` to track multiple repositories

XCODE & GIT



XCODE & GIT



```
~/project/ > git status

~/project/ > git diff

~/project/ > git checkout -b fix

~/project/ > git commit -am '…'

~/project/ > git checkout master

~/project/ > git merge fix

~/project/ > git push public
```

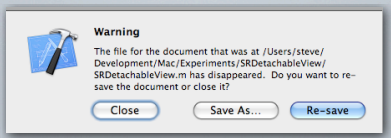
DON'T PANIC

`git checkout`

"**Read from Disk**" will bring Xcode up-to-date with your git repository

Everything's OK, Xcode just doesn't want to lose your work.

HOWEVER…



If you get this message, your should:

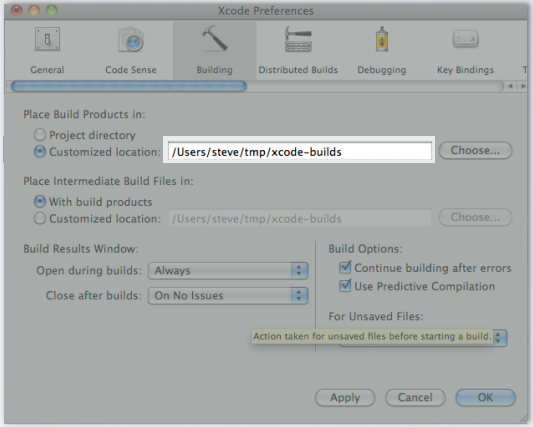
Save your work (possibly in a Temporary Directory)

Close XCode

Fix up your working directory

Open XCode again

XCODE - TIPS


Xcode Preferences
General
Code Sense
Building
Distributed Builds
Debugging
Key Bindings
Place Build Products in:
Project directory
Customized location:
/Users/steve/tmp/xcode-builds
Choose...
Place Intermediate Build Files in:
With build products
Customized location:
/Users/steve/tmp/xcode-builds
Choose...
Build Results Window:
Open during builds:
Always
Close after builds:
On No Issues
Build Options:
Continue building after errors
Use Predictive Compilation
For Unsaved Files:
Action taken for unsaved files before starting a build.
Apply
Cancel
OK

THANKS

- Patrick Stein
- Matthias Carell