Git

Git Workshop for Learning Basic Git Usage

by Matt Runion

Git -- An Overview

What Git Is

- Version Control -- and not just for source code
- Decentralized -- there is not always one source of truth
- Standard -- it is the *defacto* standard in many areas and growing
- Built for speed, data integrity and non-linear workflow

What Git Is Not

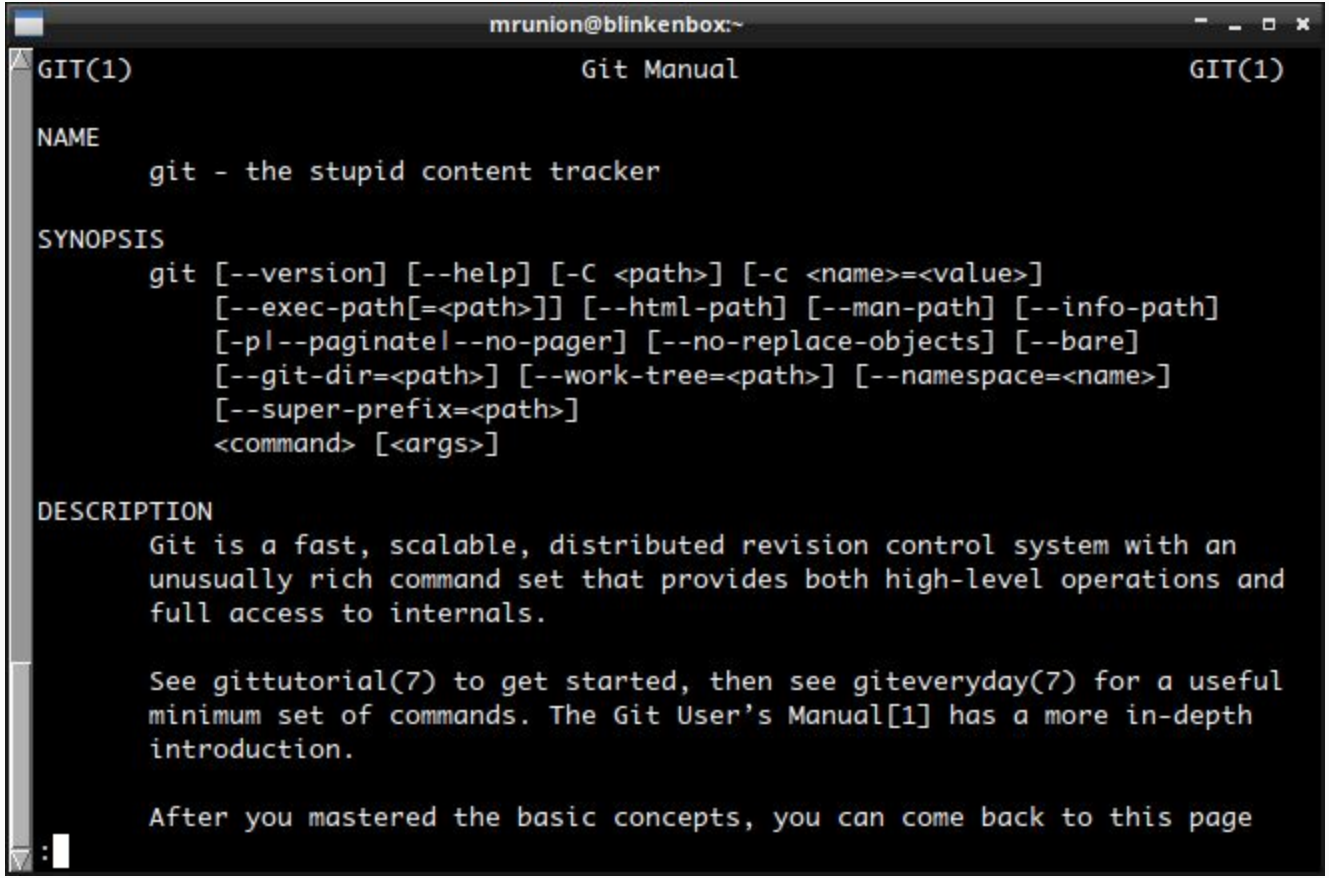
- Project Management -- no tasks, assignments, planning tools
- Centralized -- no single source of truth
- Massive -- git does one thing and does it well
- Bloated -- it doesn’t need many (any?) external dependencies

Interesting Git History

- Development started on April 3, 2005
- Project announced on April 6, 2005
- Git started self-hosting it’s own development on April 7, 2005
- First multi-branch merge occurred on April 18, 2005
- Performance goals were met on April 29, 2005

Interesting Git Anecdotes

- Linus detested CVS and touted it as the example of what ***not*** to do in a version control system
- When making design decisions in developing git, when doubt about an approach arose the decision was to ***do the exact opposite*** of what CVS had done
- As of version 4.6.5 there were over ***17 million lines of code*** in the Linux Kernel -- all managed by git
- Google Trends indicates that git is the most widely used source code management tool



Linus Torvalds describes git as “the stupid content tracker”

Git -- Basic Usage

Follow Along

Attendees are encouraged to follow along with the presentation using their own computer equipment. Repeating the actions covered in the presentation re-enforces the material, and can encourage confidence as well as raise questions.

Requirements for following along:

- Windows, Mac or Linux machine
- Git installed (only command line tools are required)

Setup

- Create a folder on the local machine named “gitworkshop” specifically for this training
- Windows users are recommended to install git from https://git-scm.com/download/win, as it will make sure the path is correct, etc. *Ensure you select “**Use Git from the Windows Command Prompt**” when configuring the PATH, and select “**Checkout Windows-style, commit Unix-style line endings**” when configuring line ending conversions.*

Creating a Git Repository

Create and navigate into a folder called “gittraining” that will contain the repository, and use the ***git init*** command:

```
git init
Initialized empty Git repository in ...
```

To make things easier for the demo, go ahead and set the repository’s ***user.name*** and ***user.email*** values. This does not always need to be done if you clone a repository, but we will set this information here to make the rest of the workshop easier.

```
git config user.name = “<Your Name>”
git config user.email = “<your@company.com>”
```

Status of a Git Repository

Querying the current status of a Git repository is done with the ***git status*** command:

```
git status
On branch master

Initial commit

Nothing to commit (create/copy files and use “git add” to track)
```

What Are We Seeing So Far?

- How easy it is to create a new repository using ***git init***
- Git defaults to calling the initial branch “master”
- The ***git status*** command tells us what branch we are on, what commit we are on and how to add files to the repository

Adding a File to a Git Repository

Create a simple text file:

```
echo “My first file” > firstfile.txt
```

Run the ***git status*** command and notice we are given instructions on how to add files, and information on any untracked files:

```
git status
On branch master

Initial commit

Untracked files:
  (use “git add <file>...” to include in what will be committed)

    firstfile.txt

Nothing added to commit but untracked files present (use “git add” to track)
```

Adding a File to a Git Repository

Add the file to the repository using the ***git add <file>*** command:

```
git add firstfile.txt
```

Run the ***git status*** command and notice we are shown what is cached (staged) and will be committed, as well as instructions on how to remove cached (staged) files:

```
git status
On branch master

Initial commit

Changes to be committed:
  (use “git rm --cached <file>...” to unstage)

    New file:   firstfile.txt
```

At this point the file is cached. It will be committed when the ***git commit*** command is ran.

Adding a File to a Git Repository

Committing the changes to the repository moves the cached file(s) to the local repository. Use the ***git commit*** command:

```
git commit -m “My first commit”
[master (root-commit) 513ac29] My first commit
 1 file changed, 1 insertion(+)
 create mode 10644 firstfile.txt
```

What Are We Seeing So Far?

- There is a difference between caching changes and committing changes
- All history is stored locally
- Questions so far?

Maintaining Files in a Git Repository

Create a new text file:

```
echo “My second file” > secondfile.txt
```

Modify the contents of the existing firstfile.txt by adding some new content:

```
// On *nix
echo >> firstfile.txt
echo “Another line!” >> firstfile.txt
```

```
// On Windows
echo. >> firstfile.txt
echo “Another line!” >> firstfile.txt
```

Maintaining Files in a Git Repository

Examine the repository status:

```
git status
On branch master
Changes not staged for commit:
  (use “git add <file>...” to update what will be committed)
  (use “git checkout -- <file>...” to discard changes in working directory)

    modified:   firstfile.txt

Untracked files:
  (use “git add <file>...” to include in what will be committed)

    secondfile.txt

No changes added to commit (use “git add” and/or “git commit -a”)
```

Maintaining Files in a Git Repository

We can see what has changed by using the ***git diff*** command:

```
git diff
diff --git a/firstfile.txt b/firstfile.txt
index 363d8b7..7577626 100644
--- a/firstfile.txt
+++ b/firstfile.txt
@@ -1 +1,3 @@
 My first file
+
+Another line!
```

Maintaining Files in a Git Repository

Add firstfile.txt to the cache:

```
git add firstfile.txt
```

Run the ***git status*** command to see the results of adding the file to the cache:

```
git status
On branch master
Changes to be committed:
  (use “git reset HEAD” to unstage)

    modified:   firstfile.txt

Untracked files:
  (use “git add <file>...” to include in what will be committed)

    secondfile.txt
```

Maintaining Files in a Git Repository

Run the ***git diff*** command again:

```
git diff
```

There was no output on the previous command. The ***git diff*** command shows only the working tree versus the repository. Since we added firstfile.txt to the cache, it is not being shown. To compare the cache to the repository use the ***git diff --cached*** command:

```
git diff --cached
diff --git a/firstfile.txt b/firstfile.txt
index 363d8b7..7577626 100644
--- a/firstfile.txt
+++ b/firstfile.txt
@@ -1 +1,3 @@
 My first file
+
+Another line!
```

Maintaining Files in a Git Repository

Add the rest of the changes to the cache:

```
// Adding ALL changes from the working copy to the cache
git add -A

// Adding only specific file changes to the cache
git add secondfile.txt
```

Run the ***git status*** command to see the results of adding the files to the cache (Note that running the ***git diff --cached*** command will now show both files):

```
git status
On branch master
Changes to be committed:
  (use “git reset HEAD” to unstage)

    modified:   firstfile.txt
    new file:   secondfile.txt
```

Maintaining Files in a Git Repository

Use the ***git commit*** command to commit all these changes to the repository:

```
git commit -m “More changes”
[master 944fc0f] More changes
 2 files changed, 3 insertions(+)
 create mode 10644 secondfile.txt
```

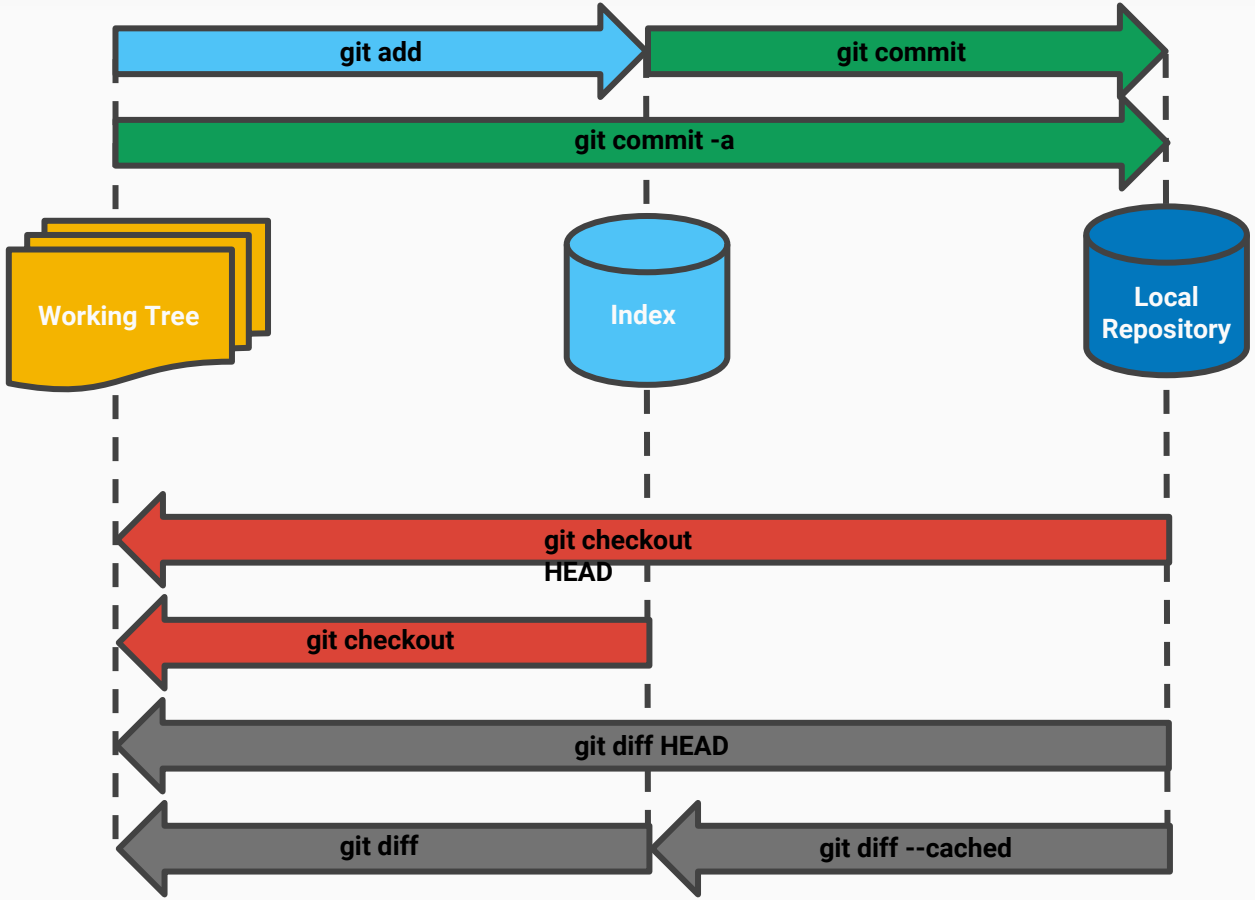
What Are We Seeing So Far?

- Git knows if a file is in the working tree, cache or repository
- Isn’t this too complex?
- Questions so far?

Local Git Repository Diagram

- Git has three “divisions” of local files -- the Working Tree, the Index (or cache) and the Local Repository
- Git handles files in these three areas
- Git commands operate on files in these three areas, or are even specific to files in certain areas

Git Local Repository Diagram



Git -- Branching

Branching in Git

- Think of branching like “Save As…”
- Branching allows multiple development paths at the same time
- Many branching strategies exist, no single strategy is “right”, though some may be “wrong”
- No matter which branching strategy is used, know which branch to use for new branches, and which to merge back to when finished working

A Note About “Checkout”

Developers generally use the word/command “checkout” when indicating one is about to acquire and modify code under version control. In **git** nomenclature the word/command “clone” is more in line with that action. In **git**, the word “checkout” means something slightly different. As long as the meaning is clear from the context it is being used in, it is assumed when a developer says “checkout” they are implying a *concept* and not a specific command.

Simple Branching in Git

Continuing the example from previously, we should be on the only branch in our repository, called “master”. To check that, list the branches in the repository using the ***git branch*** command:

```
git branch
* master
```

Create a new branch called “myfirstbranch” using the ***git branch*** command, and switch to that branch:

```
git branch myfirstbranch
git checkout myfirstbranch
Switched to branch ‘myfirstbranch’
```

Simple Branching in Git

Add a new file on this branch:

```
echo “My third file” > thirdfile.txt
```

Modify the contents of the secondfile.txt by adding some new content:

```
// On *nix
echo >> secondfile.txt
echo “Another line!” >> secondfile.txt
```

```
// On Windows
echo. >> secondfile.txt
echo “Another line!” >> secondfile.txt
```

Simple Branching in Git

Look at the repository status using git status:

```
git status
On branch myfirstbranch
Changes not staged for commit:
  (use “git add <file>...” to update what will be committed)
  (use “git checkout -- <file>...” to discard changes in working directory)

    modified:   secondfile.txt

Untracked files:
  (use “git add <file>...” to include in what will be committed)

    thirdfile.txt

No changes added to commit (use “git add” and/or “git commit -a”)
```

Simple Branching in Git

Now switch to the “master” branch using the ***git checkout*** and run **git status** again:

```
git checkout master
M       secondfile.txt
Switched to branch ‘master’

git status
On branch master
Changes not staged for commit:
  (use “git add <file>...” to update what will be committed)
  (use “git checkout -- <file>...” to discard changes in working directory)

    modified:   secondfile.txt

Untracked files:
  (use “git add <file>...” to include in what will be committed)

    thirdfile.txt

No changes added to commit (use “git add” and/or “git commit -a”)
```

Simple Branching in Git

Once again switch back to the branch named “myfirstbranch” using the ***git checkout*** command:

```
git checkout myfirstbranch
```

List all the branches using the ***git branch*** command:

```
git branch
  master
* myfirstbranch
```

Stage all currently unstaged changes using the ***git add*** command:

```
git add -A
```

What Are We Seeing So Far?

- Changing branches with uncommitted changes **does not** keep those changes tied to a specific branch
- A new branch can also be created and switched to with one command: ***git checkout -b <new_branch_name>***
- Questions so far?

Simple Merging in Git

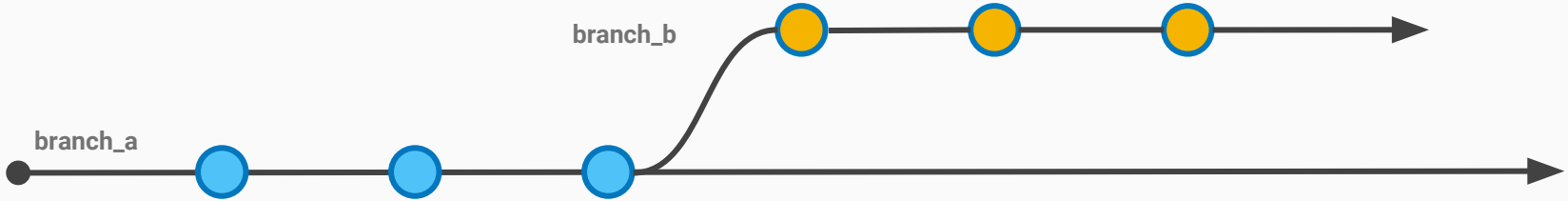
Commit the changes to the repository using the ***git commit*** command:

```
git commit -m “More changes to my files”
[myfirstbranch 20ecfd0] More changes to my files
 2 files changed, 3 insertions(+)
 create mode 10644 thirdfile.txt
```

Now let’s merge the “myfirstbranch” branch back into the master branch using the ***git merge*** command:

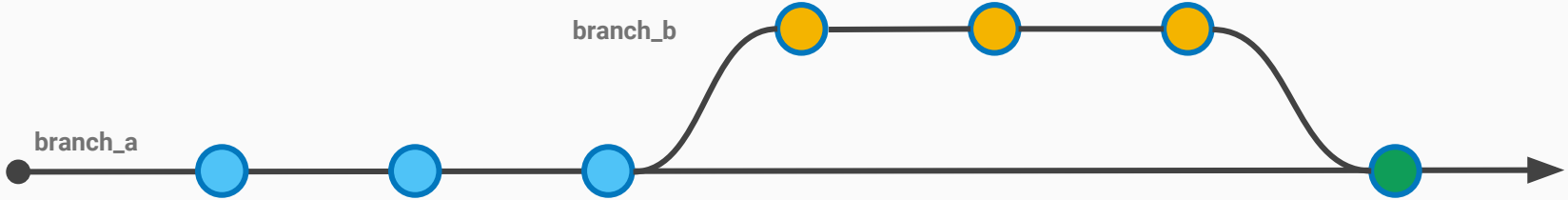
```
git checkout master
Switched to branch ‘master’
git merge myfirstbranch
Updating 944fc0f..20ecfd0
Fast-forward
 secondfile.txt | 2 ++
 thirdfile.txt  | 1 +
 2 files changed, 3 insertions(+)
 Create mode 100644 thirdfile.txt
```

Git Merging -- Fast Forward vs “Plain”



git merge branch_b -- Branch B fast-forwarded on Branch A

git merge branch_b --no-ff -- Branch B committed on Branch A



Simple Merging in Git

Finally we will delete the “myfirstbranch” branch using the ***git branch*** command:

```
git branch -d myfirstbranch
Deleted branch myfirstbranch (was 20ecfd0).
```

What Are We Seeing So Far?

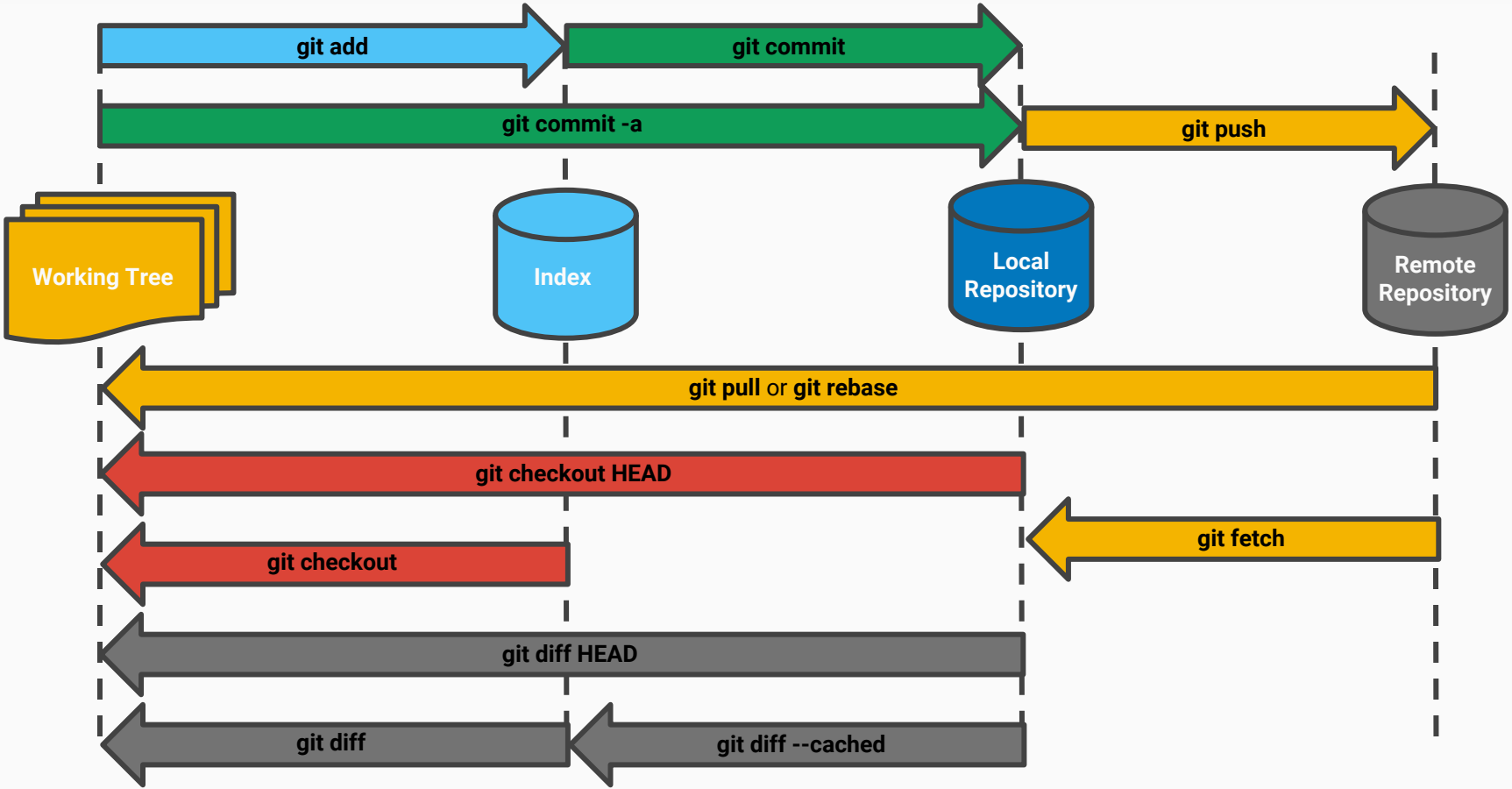
- Merging branches can result in a different look with respect to version history depending on how the merge is performed
- Deleting a branch does not remove the changes that branch provided if it was merged into another branch
- Questions so far?

Git -- Remote Repositories

Remote Repositories

- Remote repositories are simply “different” repositories from the one that is being used “locally”
- Though it is logical to consider one repository as the “Master” repository, git itself has no concept of a “Master” repository
- More than one remote repository can be specified for the local repository

Git Local and Remote Repository Diagram



Cloning a Remote Repository

- This means acquiring a copy of a specific repository from another location to a local “working” location where work will be performed
- Use the **clone** command when no local repository exists
- Note that *remote* doesn’t have to mean another machine, it just means another repository

Creating a Clone

Navigate to the “gitworkshop” folder and use the ***git clone*** command to create a clone of the “gittraining” repository called “gittrainingclone”:

```
git clone gittraining gitworkshopclone
Cloning into ‘gittrainingclone’...
done.
```

Run **git status** and notice some additional detail mentioning the origin:

```
git status
On branch master
Your branch is up-to-date with ‘origin/master’.
nothing to commit, working tree clean
```

Creating a Clone

Run the **git remote** command to see any remote repositories this local repository is aware of:

```
git remote
origin
```

More info about remote repositories can also be obtained by using the **git remote** command:

```
git remote -v
origin  /home/mrunion/gitworkshop/gittraining (fetch)
origin  /home/mrunion/gitworkshop/gittraining (push)
```

What Are We Seeing So Far?

- We have cloned a remote repository
- The clone operation has automatically added a remote called “origin” and specified the branch tracking options
- Questions so far?

Setup

- Previously covered commands will be assumed common knowledge at this point, and less emphasis will be placed on them and their output
- Open a second terminal or command prompt (or use tmux or screen, as desired) and navigate to the “.../gitworkshop/gittraining” repository
- **For the next slides it will be important to pay attention which terminal is opened in the “gittrainingclone” and “gittraining” folders**

Routine Work Flow

- Routine work on data managed by a **git** repository is not different than most other version control systems
- Routine process: branch, change, commit
- Pushing and Merging also plays a regular part in routine use, but circumstances will dictate when these are done

What Are We Doing Next?

- Create a branch called “mywork” off the “gittrainingclone” repository
- Make local changes and commit those changes
- Push those changes back to the “gittraining” origin repository on the new “mywork” branch
- Merge the “mywork” branch in the “gittrainingclone” repository and push that change back to the “gittraining” origin repository

Working with a Remote Repository

Create a branch off the “master” branch in the “gittrainingclone” repository:

```
// REPOSITORY: gittrainingclone
git checkout -b mywork
origin
```

Make some file changes and additions:

```
// On *nix
echo >> thirdfile.txt
echo “More changes” >> thirdfile.txt
echo “Fourth file” >> fourthfile.txt
```

```
// On Windows
echo. >> thirdfile.txt
echo “More changes” >> thirdfile.txt
echo “Fourth file” >> fourthfile.txt
```

Working with a Remote Repository

Add the changes to the cache, then commit the changes to the local repository:

```
// REPOSITORY: gittrainingclone
git add -A
git commit -m “Made some changes on my branch”
```

Verify that the branch “mywork” only exists locally on the “gittrainingclone” repository and not on the “gittraining” origin repository:

```
// REPOSITORY: gittrainingclone
git branch
  master
* mywork
```

```
// REPOSITORY: gittraining
git branch
* master
```

Working with a Remote Repository

Use the **git push** command to push the local changes up to the remote repository:

```
// REPOSITORY: gittrainingclone
git push -u origin mywork
Counting objects: 4, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 402 bytes | 0 bytes/s, done.
Total 4 (delta 0), reused 0 (delta 0)
To /home/mrunion/gitworkshop/gittraining
 * [new branch]      mywork -> mywork
Branch mywork set up to track remote branch mywork from origin.
```

Working with a Remote Repository

Verify that the branch “mywork” now exists in both repositories:

```
// REPOSITORY: gittrainingclone
git branch
  master
* mywork
```

```
// REPOSITORY: gittraining
git branch
* master
  mywork
```

Working with a Remote Repository

Use the **git remote** command to show what local branches track remote branches:

```
// REPOSITORY: gittrainingclone
git remote show origin
* remote origin
  Fetch URL: /home/mrunion/gitworkshop/gittraining
  Push  URL: /home/mrunion/gitworkshop/gittraining
  HEAD branch: master
  Remote branches:
    master tracked
    mywork tracked
  Local branches configured for 'git pull':
    master merges with remote master
    mywork merges with remote mywork
  Local refs configured for 'git push':
    master pushes to master (up to date)
    mywork pushes to mywork (up to date)
```

Working with a Remote Repository

Make some file changes:

```
// On *nix
echo >> fourthfile.txt
echo “Something else changed” >> fourthfile.txt
```

```
// On Windows
echo. >> fourthfile.txt
echo “Something else changed” >> fourthfile.txt
```

Commit the changes to the local repository:

```
// REPOSITORY: gittrainingclone
git add -A
git commit -m “More changes on this branch”
```

Use the **git remote** command to show a branch is now ahead of the remote:

```
// REPOSITORY: gittrainingclone
git remote show origin
  :
    mywork pushes to mywork (fast-forwardable)
```

Working with a Remote Repository

Switch to the “master” branch, merge the “mywork” branch, then push that code to the “gittraining” repository:

```
// REPOSITORY: gittrainingclone
git checkout master
git merge mywork
git push
```

What Are We Seeing So Far?

- We have made changes to our local repository and pushed them to a remote repository
- We have inadvertently made assumptions about the state of the remote repository in a few circumstances (not checking for updates before we push or merge, etc.)
- Questions so far?

Updating a Local Repository from the Remote

- Updating a local repository from a remote repository is accomplished by fetching and pulling
- Pulling from a remote updates all the way to the working tree (and involves an implicit fetch and git merge)
- Fetching from a remote only updated the local repository, not the working tree

What Are We Doing Next?

- Make changes to the “gittraining” origin repository on the master branch
- Fetch those changes into the “gittrainingclone” local repository
- Merge those changes into the “gittrainingclone” local repository’s working tree

Updating from a Remote Repository

Make sure we are on the master branch in the “gittraining” repository:

```
// REPOSITORY: gittraining
git checkout master
```

Make some file changes and additions:

```
// On *nix
echo >> fourthfile.txt
echo “Changes on the remote” >> fourthfile.txt
echo “A fifth new file appears...” >> fifthfile.txt
```

```
// On Windows
echo. >> fourthfile.txt
echo “Changes on the remote” >> fourthfile.txt
echo “A fifth new file appears...” >> fifthfile.txt
```

Add and commit the changes to the local (“gittraining”) repository:

```
// REPOSITORY: gittraining
git add -A
git commit -m “Changes to be distributed”
```

Updating from a Remote Repository

Make sure we are on the master branch in the “gittrainingclone” repository:

```
// REPOSITORY: gittrainingclone
git checkout master
```

Run the **git status** command and look at the message:

```
git status
On branch master
Your branch is up-to-date with ‘origin/master’.
nothing to commit, working tree clean
```

Updating from a Remote Repository

Use the **git fetch** command to retrieve any changes from the remote:

```
// REPOSITORY: gittrainingclone
git fetch origin master
remote: Counting objects: 4, done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 4 (delta 0), reused 0 (delta 0)
Unpacking objects: 100% (4/4), done.
From /home/mrunion/gitworkshop/gittraining
   fd5714c..f7fdbbd  master     -> origin/master
```

Now run the **git status** command again and look at the message:

```
git status
On branch master
Your branch is behind ‘origin/master’ by 1 commit, and can be
fast-forwarded.
  (use “git pull” to update your local branch)
nothing to commit, working tree clean
```

Updating from a Remote Repository

Use the **git diff** command to examine the differences in what has been fetched:

```
// REPOSITORY: gittrainingclone
git diff master origin/master
diff --git a/fifthfile.txt b/fifthfile.txt
new file mode 100644
index 0000000..09e0eb8
--- /dev/null
+++ b/fifthfile.txt
@@ -0,0 +1 @@
+A fifth new file appears...
diff --git a/fourthfile.txt b/fourthfile.txt
new file mode 100644
index 06c6be9..662f6f4 100644
--- a/fourthfile.txt
+++ b/fourthfile.txt
@@ -1,3 +1,5 @@
 Fourth file

 Something else changed
+
+Changes on the remote
```

Updating from a Remote Repository

Use the **git merge** command merge the newly fetched data into the local repository:

```
// REPOSITORY: gittrainingclone
git merge origin/master
Updating fd5714c..f7fdbbd
Fast-forward
 fifthfile.txt  | 1 +
 fourthfile.txt | 2 ++
 2 files changed, 3 insertions(+)
 create mode 100644 fifthfile.txt
```

What Are We Seeing So Far?

- We have retrieved changes that have been made to a remote repository and merged them into our own clone of that repository, but only for branches that already exist
- We see there is such a thing as tracked remote branches, and we see that we can control what branches are fetch/merge with our own
- Questions so far?

What Are We Doing Next?

- Make changes to the “gittraining” origin repository on a newly created branch
- Fetch those changes into the “gittrainingclone” local repository
- Checkout the new branch and see that it sets up tracking for us

Getting a new Branch from a Remote Repository

Make sure we are on the master branch in the “gittraining” repository, then create a new repository named “otherwork” and check it out:

```
// REPOSITORY: gittraining
git checkout master
git checkout -b otherwork
```

Make some file additions:

```
echo “Sixth file” >> sixthfile.txt
```

Add and commit the changes to the local (“gittraining”) repository:

```
// REPOSITORY: gittraining
git add -A
git commit -m “A new branch on the remote”
```

Getting a new Branch from a Remote Repository

Get a list of all remote branches by using the **git remote** command:

```
// REPOSITORY: gittrainingclone
git remote show origin
* remote origin
  Fetch URL: /home/mrunion/gitworkshop/gittraining
  Push  URL: /home/mrunion/gitworkshop/gittraining
  HEAD branch: master
  Remote branches:
    master tracked
    mywork tracked
    otherwork new (next fetch will store in remotes/origin)
  Local branches configured for 'git pull':
    master merges with remote master
    mywork merges with remote mywork
  Local refs configured for 'git push':
    master pushes to master (up to date)
    mywork pushes to mywork (up to date)
```

Getting a new Branch from a Remote Repository

List the remote branches our local repository currently knows about with the **git branch** command:

```
// REPOSITORY: gittrainingclone
git branch -r
  origin/HEAD -> origin/master
  origin/master
  origin/mywork
```

Now run the **git fetch** command:

```
// REPOSITORY: gittrainingclone
git fetch origin
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
From /home/mrunion/gitworkshop/gittraining
 * [new branch]      otherwork  -> origin/otherwork
```

Getting a new Branch from a Remote Repository

Rerun the **git branch** command:

```
// REPOSITORY: gittrainingclone
git branch -r
  origin/HEAD -> origin/master
  origin/master
  origin/mywork
  origin/otherwork
```

Check out the new branch using the **git checkout** command:

```
// REPOSITORY: gittrainingclone
git checkout otherwork
Branch otherwork set up to track remote branch otherwork from origin.
Switched to a new branch 'otherwork'
```

What Are We Seeing So Far?

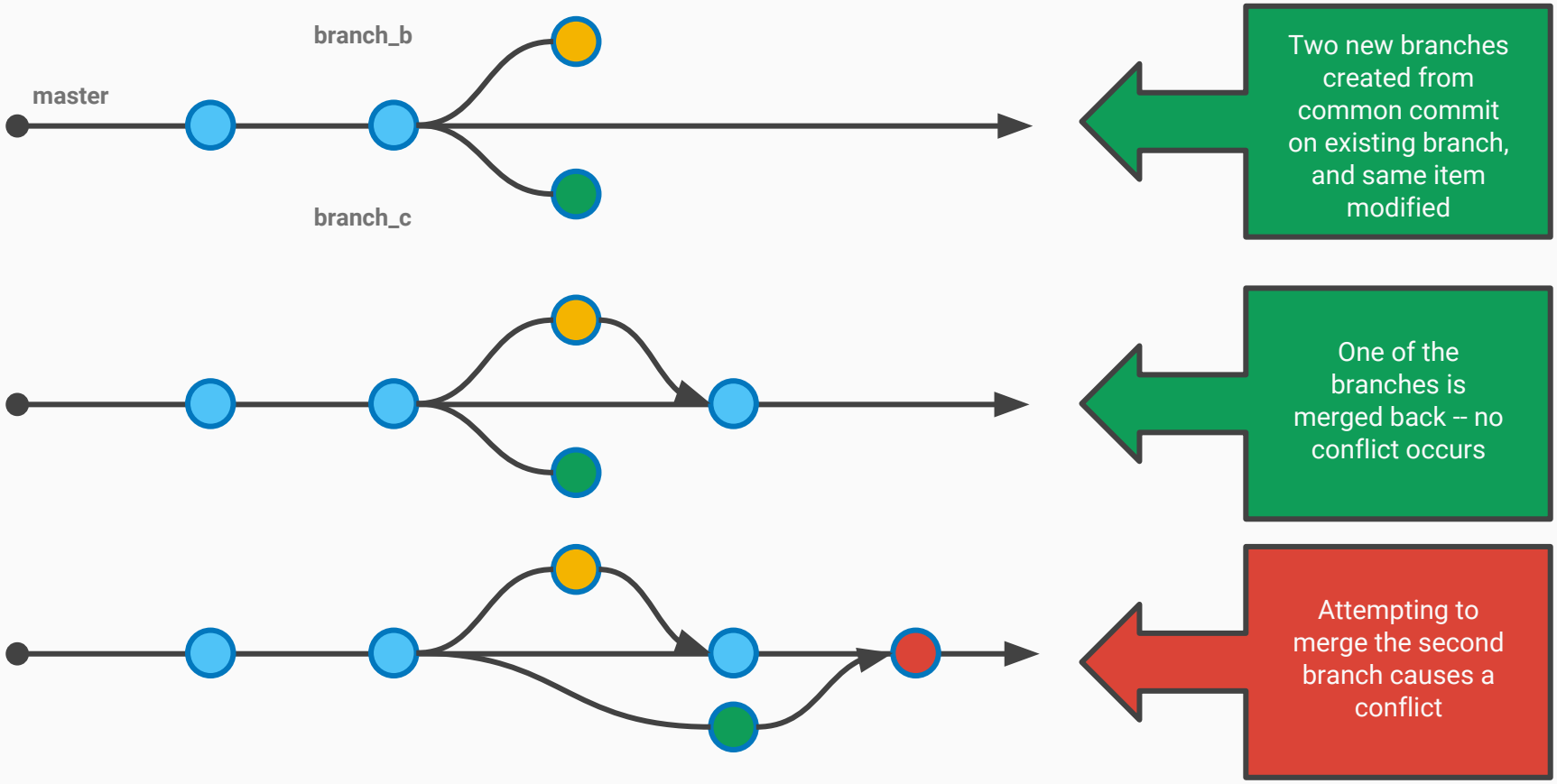
- We have queried the remote repository to see its branches
- We have fetched and checked out a new branch that was added to the remote repository and confirmed we are tracking that branch
- Questions so far?

Git -- Merge Conflicts

Merge Conflicts

- Happen when data changes in two different branches or repositories and git cannot resolve the commits
- Sometimes resolution is simple and sometimes it can be very complex
- Merge conflicts have to be evaluated on a case-by-case basis to find the proper solution

Visual Representation of a Merge Conflict



What Are We Doing Next?

- Make changes to the “gittrainingclone” that will cause a conflict
- Resolve that conflict
- Understand that this is a simple case and a contrived example

Handling a Merge Conflict

Make sure we are on the master branch in the “gittrainingclone” repository:

```
// REPOSITORY: gittrainingclone
git checkout master
```

Using the **git branch** command, create two new branches -- “branch_b” and “branch_c”:

```
git branch branch_b
git branch branch_c
```

Handling a Merge Conflict

Use the **git checkout** command and checkout “branch_b”:

```
git checkout branch_b
```

Make some changes to a file:

```
echo >> firstfile.txt // On Windows use echo. >> firstfile.txt
echo “Check out my awesome bug fix!” >> firstfile.txt
```

Stage and commit that change:

```
git add -A
git commit -m “Another bug bites the dust”
```

Handling a Merge Conflict

Use the **git checkout** command and checkout “branch_c”:

```
git checkout branch_c
```

Make some changes to the same file that was previously changed:

```
echo >> firstfile.txt // On Windows use echo. >> firstfile.txt
echo “I am adding a new feature” >> firstfile.txt
```

Stage and commit that change:

```
git add -A
git commit -m “New feature added”
```

Handling a Merge Conflict

Now **git checkout** the master branch:

```
git checkout master
```

Use the git merge command to merge “branch_b” into master:

```
git merge branch_b
```

Now merge “branch_c”:

```
git merge branch_c
Auto-merging firstfile.txt
CONFLICT (content): Merge conflict in firstfile.txt
Automatic merge failed; fix conflicts and then commit the result
```

What Are We Seeing So Far?

- We have a merge conflict created by changing the same file on two different branches
- We now have to look at the file and determine what to do to resolve the conflict
- Questions so far?

Handling a Merge Conflict

Look at the file content to see what git has told us about the conflict:

```
less firstfile.txt

// Or

type firstfile.txt
```

Look at the file's content to see what git has told us about the conflict:

```
My first file

Another line!

<<<<<<< HEAD
Check out my awesome bug fix
=======
I am adding a new feature
>>>>>>> branch_c
```

Handling a Merge Conflict

Using the tool of choice (vi, Notepad, Sublime), correct the output of the file to be as shown and save the file:

```
My first file

Another line!

Check out my awesome bug fix
I am adding a new feature
```

Now add and commit the file to the repository:

```
git add firstfile.txt
git commit -m “Fixed merge conflict”
```

What Are We Seeing So Far?

- We saw the process for solving a merge conflict
- Merge conflicts can be simple to solve, or very difficult -- each case is unique
- Questions so far?

Conclusion of Basic Git

Where to Next?

- Discuss strategies for organizing a repository
- Discuss working with outside developers, forking, etc.
- Deep-diving into specific questions, or role-playing “what if” scenarios
- **Thank you for your time and attention!**