How to Use BitBucket’s Version Control

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Version control allows multiple people to edit a document at the same time. The Learn Mi’gmaq project uses BitBucket to keep track of all files that the website relies on. This allows us to go back to a previous version if we accidentally modify a file.

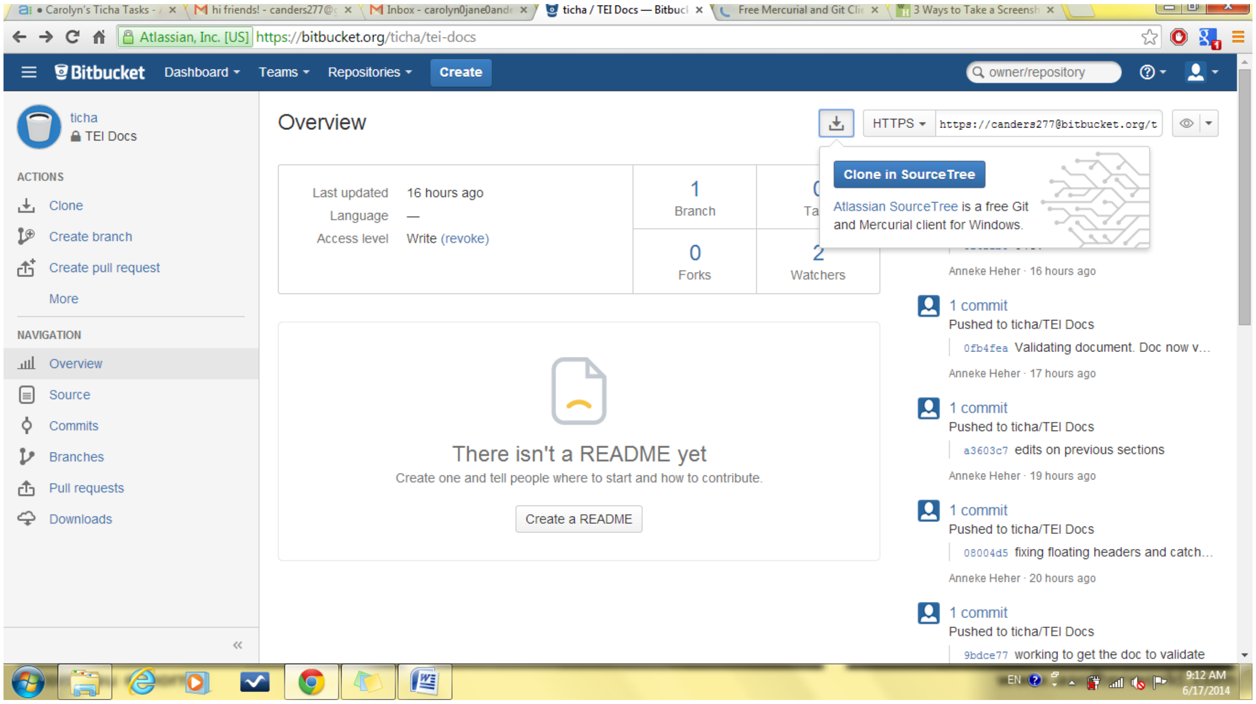
The software at the heart of the system is GIT, which is used by many other websites as well. In a Git system, all files are stored in a central **repository** (repo), usually online. We will be using the site BitBucket to host our repository.

One way to access a repository is using the command line on your computer. However, Bitbucket is compatible with a program called **Atlassian Sourcetree** that provides a more visual interface. The rest of the tutorial assumes that you will be using Sourcetree, but the general framework holds true for command line use as well.

Getting Started

1. In order to use Bitbucket, you will need create a Bitbucket account. Once you have done this, you will be invited to join the Learn Mi’gmaq repository by someone else on the project. It is called canders277.bitbucket.org.

2. Next, you will need to download Sourcetree. Go to the overview page for the Learn Mi’gmaq project on Bitbucket. On the right-hand side of the Overview title, there will be a download image. Clicking on it will give you an option of downloading Sourcetree.



Overview

https://canders277@bitbucket.org/t

Atlassian SourceTree is a free Git and Mercurial client for Windows.

Last updated	16 hours ago
Language	—
Access level	Write (revoke)

1 Branch · 0 Forks · 2 Watchers

There isn't a README yet

Create one and tell people where to start and how to contribute.

Create a README

Anneke Heher · 16 hours ago

1 commit
Pushed to ticha/TEI Docs
0fb4fea Validating document. Doc now v...
Anneke Heher · 17 hours ago

1 commit
Pushed to ticha/TEI Docs
a3603c7 edits on previous sections
Anneke Heher · 19 hours ago

1 commit
Pushed to ticha/TEI Docs
08004d5 fixing floating headers and catch...
Anneke Heher · 20 hours ago

1 commit
Pushed to ticha/TEI Docs
9bdce77 working to get the doc to validate

Figure 1. Ticha Overview page with link to Atlassian SourceTree.

3. You will be taken to the Sourcetree site. Download the version for your operating system.

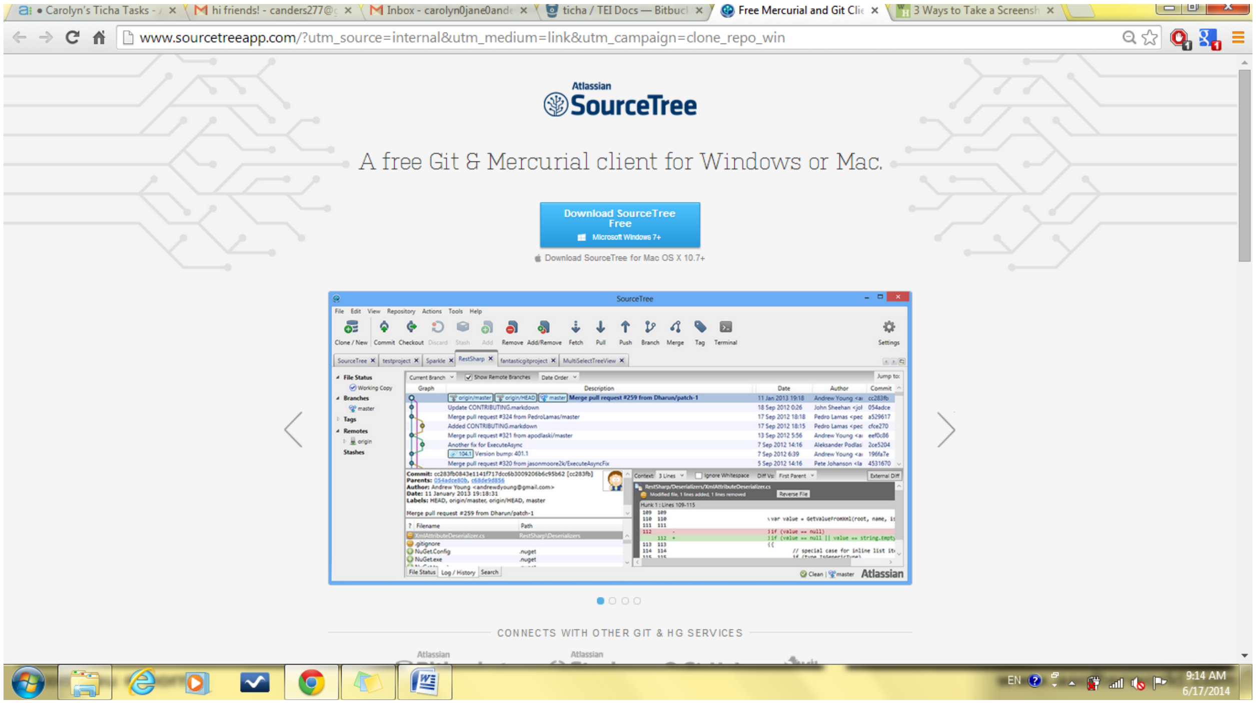
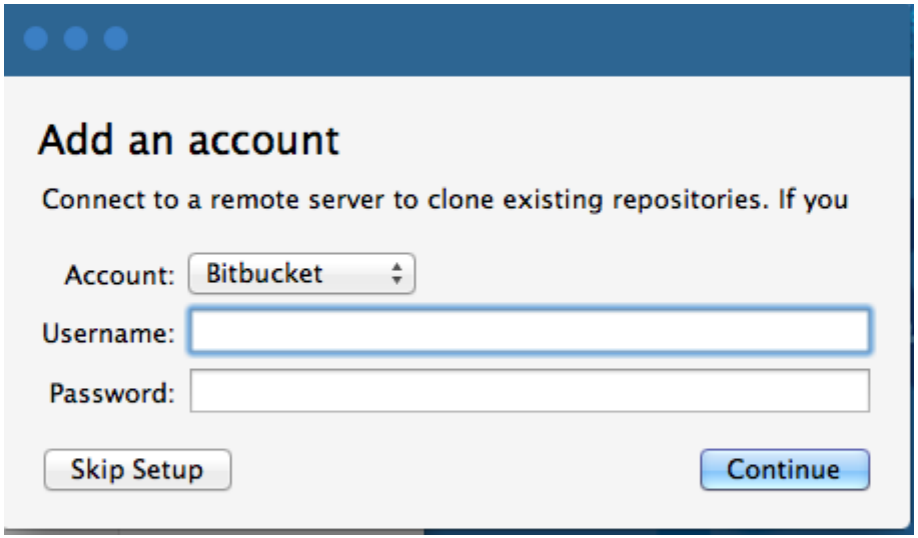

www.sourcetreeapp.com/?utm_source=internal&utm_medium=link&utm_campaign=clone_repo_win
Atlassian
SourceTree
A free Git & Mercurial client for Windows or Mac.
Download SourceTree Free
Microsoft Windows 7+
Download SourceTree for Mac OS X 10.7+
CONNECTS WITH OTHER GIT & HG SERVICES

Figure 2. Atlassian Sourcetree download page.

4. You may be prompted for your login information as part of the set-up. If so, enter it.



Add an account

Connect to a remote server to clone existing repositories. If you

Account: Bitbucket

Username:

Password:

Skip Setup

Continue

Figure 3. Setting up Sourcetree.

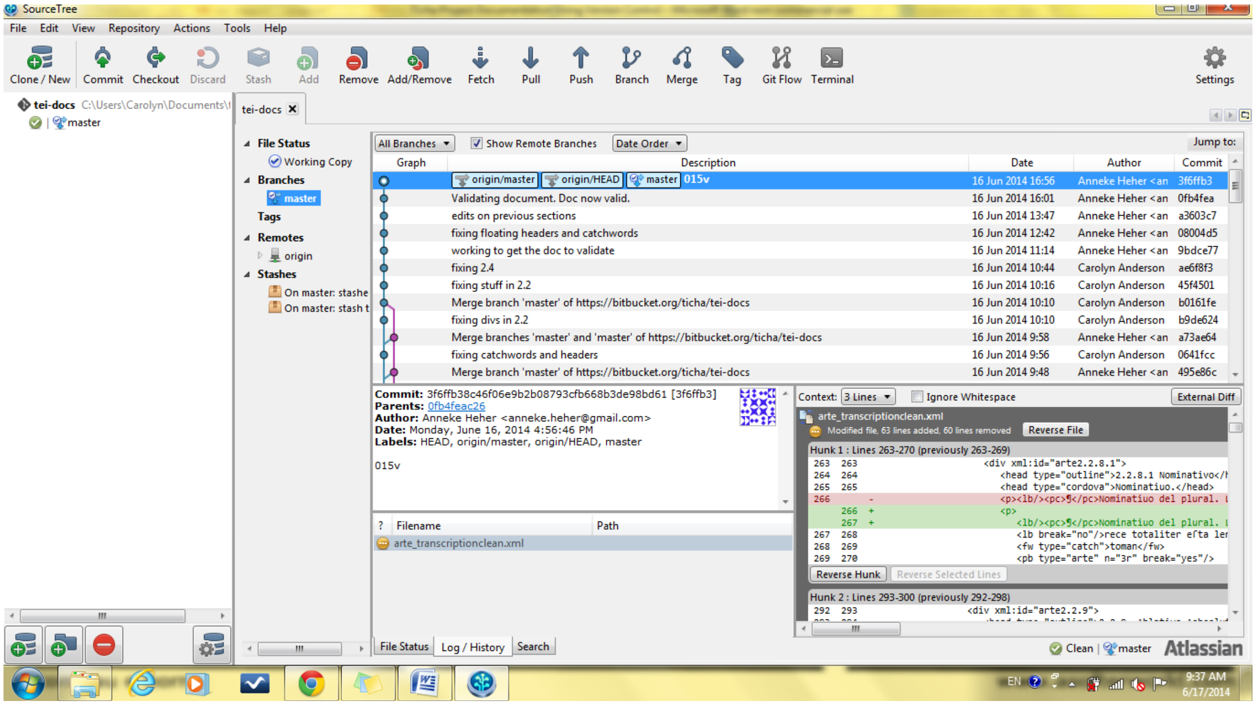
5. To work with the files, the first step is to **clone** the repository. This creates a copy of the repository on your computer. This is called a **local copy**. If you are prompted to do this during setup, select the **canders277/canders277.bitbucket.org repo**. You can also go back to the Bitbucket website and click on the same download icon. This time, choose the option **Clone in Sourcetree. Make sure to notice what destination folder the repo is placed in.**

6. Now you can open and edit the files on your own computer.

Using version control

A central idea in using Git is branching. When you clone a repository and make changes to it, your copy of the files **branches** off from the **master** (the central repository). Unless you want to end up with a different set of files for every person that edits the repo, at some point your branch will need to **merge** back into the master.

You can view the branching history of the repository by clicking on **master** under **Branches** in Sourcetree.



☑ Show Remote Branches

Graph	Description	Date	Author	Commit
	origin/master origin/HEAD master 015v	16 Jun 2014 16:56	Anneke Heher <an	3f6ffb3
	Validating document. Doc now valid.	16 Jun 2014 16:01	Anneke Heher <an	0fb4fea
	edits on previous sections	16 Jun 2014 13:47	Anneke Heher <an	a3603c7
	fixing floating headers and catchwords	16 Jun 2014 12:42	Anneke Heher <an	08004d5
	working to get the doc to validate	16 Jun 2014 11:14	Anneke Heher <an	9bdce77
	fixing 2.4	16 Jun 2014 10:44	Carolyn Anderson	ae6f8f3
	fixing stuff in 2.2	16 Jun 2014 10:16	Carolyn Anderson	45f4501
	Merge branch 'master' of https://bitbucket.org/ticha/tei-docs	16 Jun 2014 10:10	Carolyn Anderson	b0161fe
	fixing divs in 2.2	16 Jun 2014 10:10	Carolyn Anderson	b9de624
	Merge branches 'master' and 'master' of https://bitbucket.org/ticha/tei-docs	16 Jun 2014 9:58	Anneke Heher <an	a73ae64
	fixing catchwords and headers	16 Jun 2014 9:56	Carolyn Anderson	0641fcc
	Merge branch 'master' of https://bitbucket.org/ticha/tei-docs	16 Jun 2014 9:48	Anneke Heher <an	495e86c

Commit: 3f6ffb38c46f06e9b2b08793cfb668b3de98bd61 [3f6ffb3]
Parents: 0fb4feac26
Author: Anneke Heher <anneke.heher@gmail.com>
Date: Monday, June 16, 2014 4:56:46 PM
Labels: HEAD, origin/master, origin/HEAD, master

015v

?	Filename	Path
	arte_transcriptionclean.xml	

Context: 3 Lines □ Ignore Whitespace External Diff

arte_transcriptionclean.xml
Modified file, 63 lines added, 60 lines removed Reverse File

Hunk 1 : Lines 263-270 (previously 263-269)

```
263  263            <div xml:id="arte2.2.8.1">
264  264              <head type="outline">2.2.8.1 Nominativo</h
265  265              <head type="cordova">Nominatiuo.</head>
266       -           <p><lb/><pc>¶</pc>Nominatiuo del plural. l
     266  +           <p>
     267  +             <lb/><pc>¶</pc>Nominatiuo del plural. l
267  268                <lb break="no"/>rece totaliter eſta ler
268  269                <fw type="catch">toman</fw>
269  270                <pb type="arte" n="3r" break="yes"/>
```

Reverse Hunk Reverse Selected Lines

Hunk 2 : Lines 293-300 (previously 292-298)

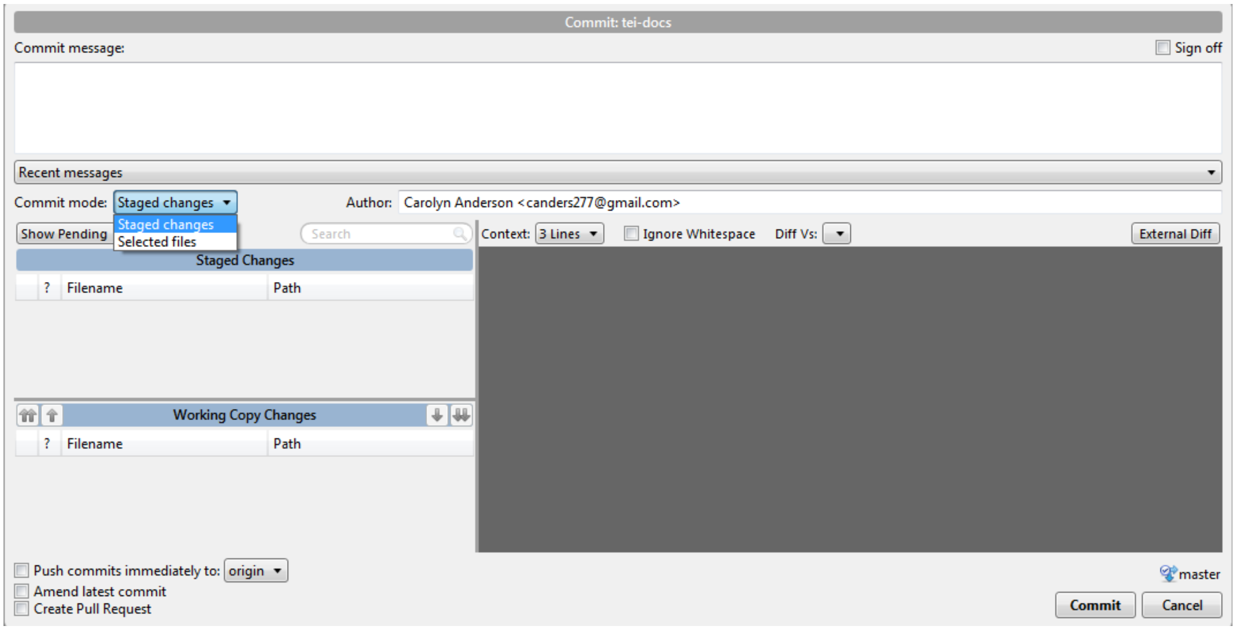
```
292  293          <div xml:id="arte2.2.9">
```

Figure 4. Branching history.

One way that your local copy may diverge from the master is when you change the files. In this case, you want to update the master branch with the changes you have made. There are several steps in this process.

1. To begin, click the commit button across the top of Sourcetree.
2. First, you need to tell the system which changes you would like to propagate to the master. This is called **staging**.

   You can select entire files or chunks of files. You can stage all changes by changing the **commit mode** on the left, or select chunks to stage in the window on the right.



Commit: tei-docs

Commit message:

□ Sign off

Commit mode: Staged changes

Author: Carolyn Anderson <canders277@gmail.com>

Context: 3 Lines

□ Ignore Whitespace

□ Push commits immediately to: origin

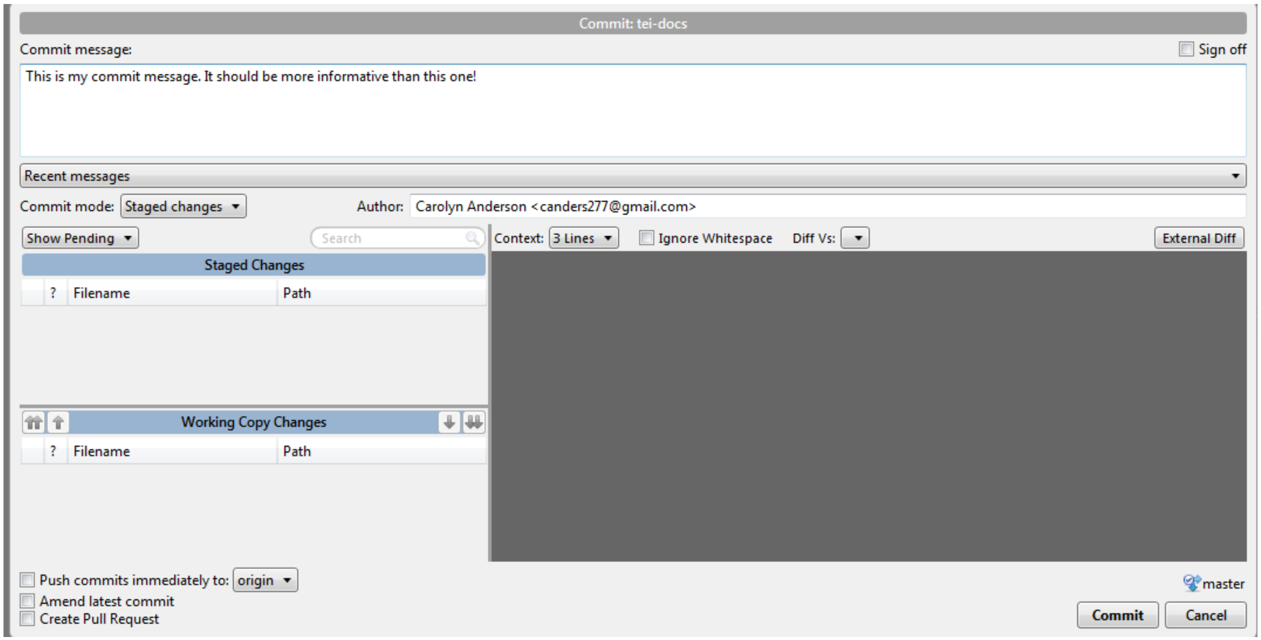
□ Amend latest commit

□ Create Pull Request

Figure 5. Commit box with staging options.

3. Next, you need to **commit** your changes. This bundles the changes you have made into one update and allows you to add a message describing your edits.

   It is good practice to write descriptive commit messages in case you decide to revert your changes in the future.



Commit: tei-docs

Commit message:

This is my commit message. It should be more informative than this one!

□ Sign off

Commit mode: Staged changes

Author: Carolyn Anderson <canders277@gmail.com>

Show Pending

Context: 3 Lines

□ Ignore Whitespace

□ Push commits immediately to: origin

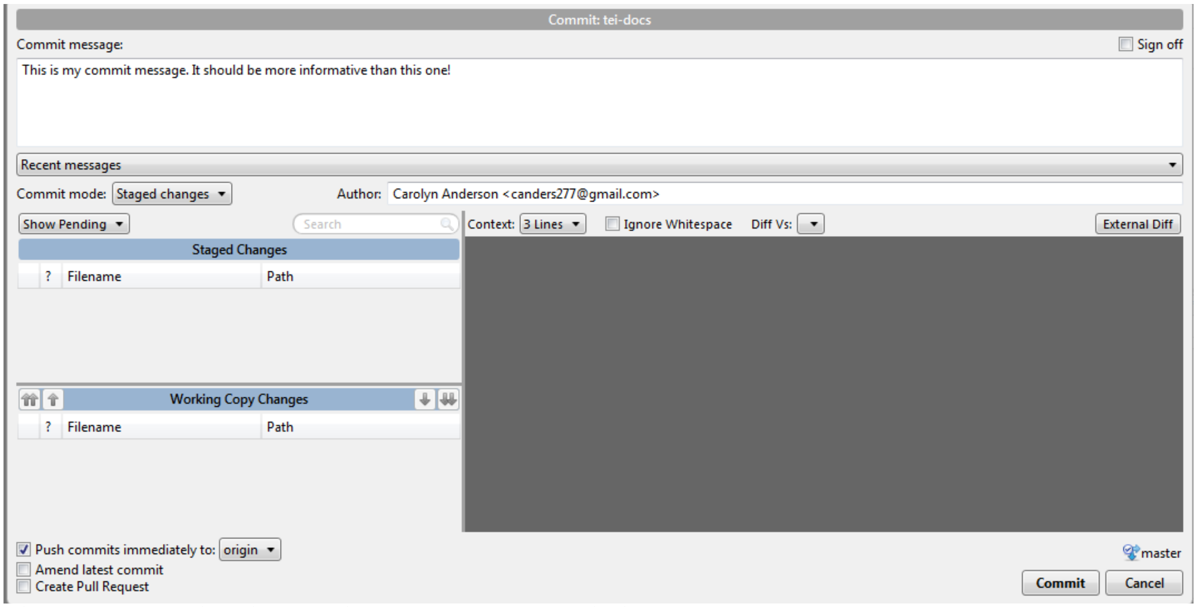
□ Amend latest commit

□ Create Pull Request

Figure 6. Commit box with commit message.

4. Last, you need to **push** your changes. This sends the changes to the master to update it.

   You can do this automatically when you commit by checking the box labeled **Push commits immediately to origin** in the left hand corner of the commit box, or you can do it by clicking on the push button across the top of Sourcetree.



Commit: tei-docs

Commit message: ☐ Sign off

This is my commit message. It should be more informative than this one!

Recent messages

Commit mode: Staged changes   Author: Carolyn Anderson <canders277@gmail.com>

☑ Push commits immediately to: origin

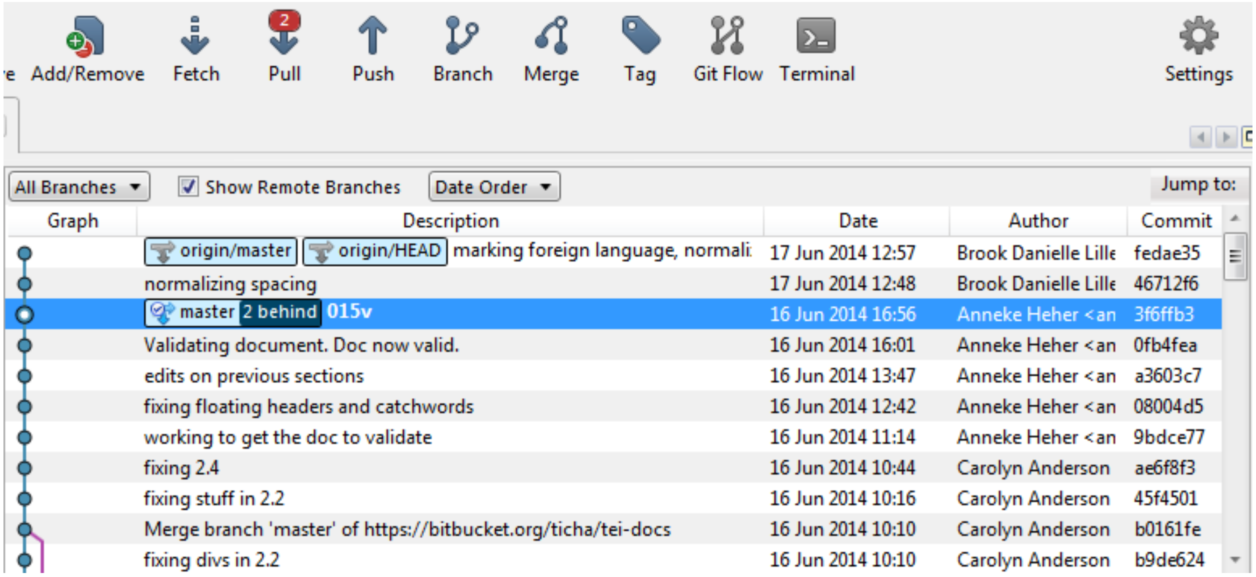
☐ Amend latest commit

☐ Create Pull Request

Figure 7. Pushing immediately when committing.

Another way your copy may diverge is when someone else makes changes and pushes them to the master. In order to catch up, you need to accept their changes. This is done by **pulling**. Pulling updates your local copy with changes that have been made to the master by other users.

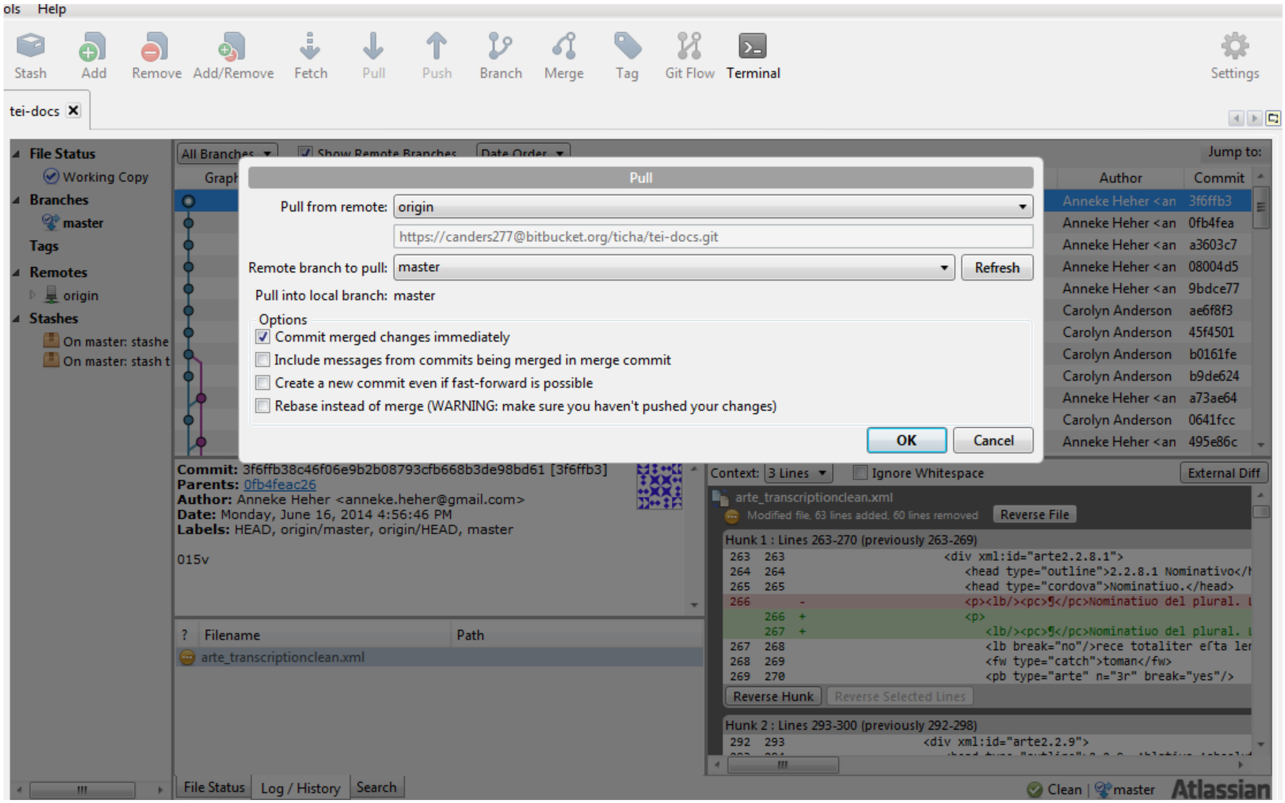
1. Sourcetree will usually show you when you need to pull by displaying a red number on the pull button across the top.



Graph	Description	Date	Author	Commit
	origin/master origin/HEAD marking foreign language, normali	17 Jun 2014 12:57	Brook Danielle Lille	fedae35
	normalizing spacing	17 Jun 2014 12:48	Brook Danielle Lille	46712f6
	master 2 behind 015v	16 Jun 2014 16:56	Anneke Heher <an	3f6ffb3
	Validating document. Doc now valid.	16 Jun 2014 16:01	Anneke Heher <an	0fb4fea
	edits on previous sections	16 Jun 2014 13:47	Anneke Heher <an	a3603c7
	fixing floating headers and catchwords	16 Jun 2014 12:42	Anneke Heher <an	08004d5
	working to get the doc to validate	16 Jun 2014 11:14	Anneke Heher <an	9bdce77
	fixing 2.4	16 Jun 2014 10:44	Carolyn Anderson	ae6f8f3
	fixing stuff in 2.2	16 Jun 2014 10:16	Carolyn Anderson	45f4501
	Merge branch 'master' of https://bitbucket.org/ticha/tei-docs	16 Jun 2014 10:10	Carolyn Anderson	b0161fe
	fixing divs in 2.2	16 Jun 2014 10:10	Carolyn Anderson	b9de624

Figure 8. Pull needed.

2. In order to pull, click this button. The following dialogue box will appear. Check **commit merged changes immediately** and press **OK**.



Pull

Pull from remote: origin

https://canders277@bitbucket.org/ticha/tei-docs.git

Remote branch to pull: master [Refresh]

Pull into local branch: master

Options

☑ Commit merged changes immediately
☐ Include messages from commits being merged in merge commit
☐ Create a new commit even if fast-forward is possible
☐ Rebase instead of merge (WARNING: make sure you haven't pushed your changes)

[OK] [Cancel]

Author	Commit
Anneke Heher <an	3f6ffb3
Anneke Heher <an	0fb4fea
Anneke Heher <an	a3603c7
Anneke Heher <an	08004d5
Anneke Heher <an	9bdce77
Carolyn Anderson	ae6f8f3
Carolyn Anderson	45f4501
Carolyn Anderson	b0161fe
Carolyn Anderson	b9de624
Anneke Heher <an	a73ae64
Carolyn Anderson	0641fcc
Anneke Heher <an	495e86c

Commit: 3f6ffb38c46f06e9b2b08793cfb668b3de98bd61 [3f6ffb3]
Parents: 0fb4feac26
Author: Anneke Heher <anneke.heher@gmail.com>
Date: Monday, June 16, 2014 4:56:46 PM
Labels: HEAD, origin/master, origin/HEAD, master

015v

?	Filename	Path
	arte_transcriptionclean.xml	

Context: 3 Lines ☐ Ignore Whitespace [External Diff]

arte_transcriptionclean.xml
Modified file, 63 lines added, 60 lines removed [Reverse File]

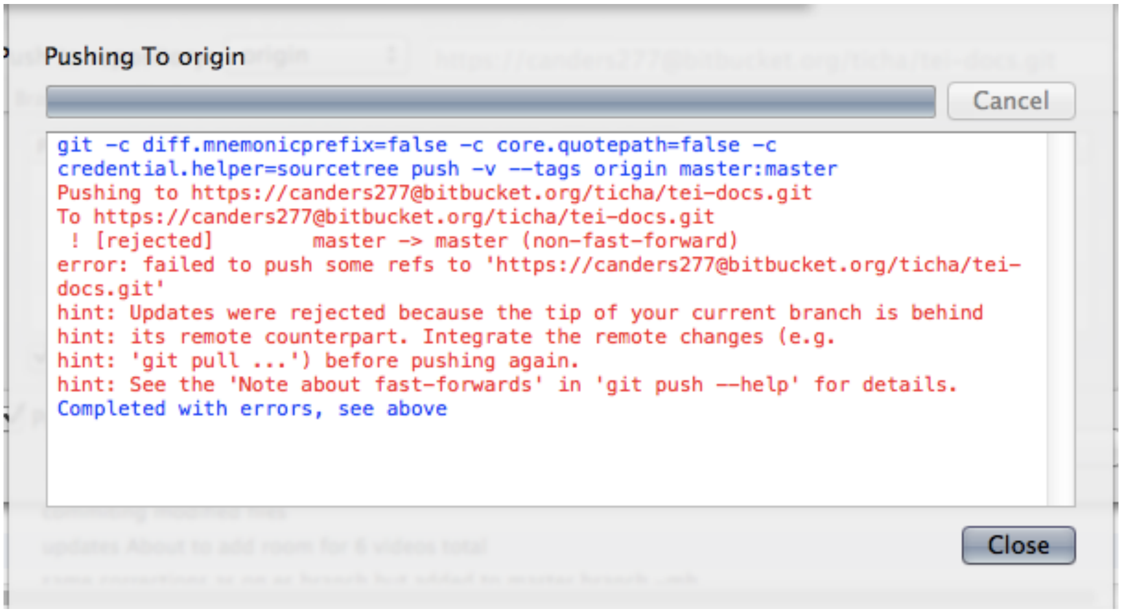
```
Hunk 1 : Lines 263-270 (previously 263-269)
263  263            <div xml:id="arte2.2.8.1">
264  264               <head type="outline">2.2.8.1 Nominativo</h
265  265               <head type="cordova">Nominatiuo.</head>
266       -            <p><lb/><pc>¶</pc>Nominatiuo del plural. l
     266  +            <p>
     267  +               <lb/><pc>¶</pc>Nominatiuo del plural. l
267  268                  <lb break="no"/>rece totaliter eſta len
268  269                  <fw type="catch">toman</fw>
269  270                  <pb type="arte" n="3r" break="yes"/>
[Reverse Hunk] [Reverse Selected Lines]

Hunk 2 : Lines 293-300 (previously 292-298)
292  293          <div xml:id="arte2.2.9">
```

Figure 9. Pulling updates.

3. Afterwards, you should see a new commit message appear on the branch graph.

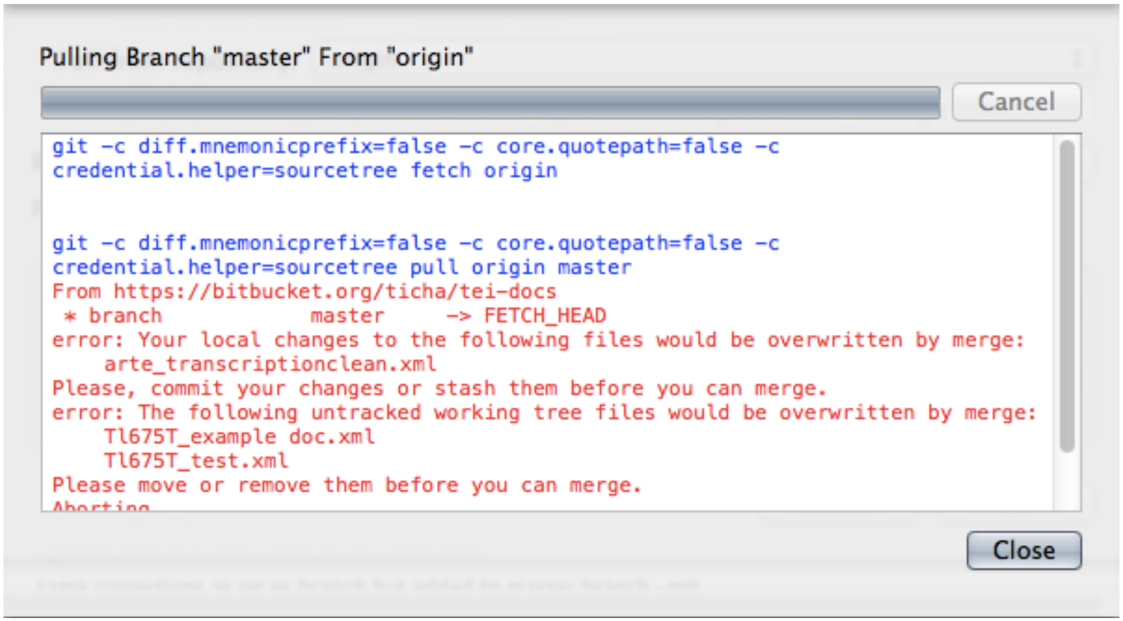
The order of these steps matters. First, Sourcetree will not allow you to push changes unless your own branch is up-to-date. This means you will need to pull any changes before you can push your own.



```
git -c diff.mnemonicprefix=false -c core.quotepath=false -c
credential.helper=sourcetree push -v --tags origin master:master
Pushing to https://canders277@bitbucket.org/ticha/tei-docs.git
To https://canders277@bitbucket.org/ticha/tei-docs.git
 ! [rejected]        master -> master (non-fast-forward)
error: failed to push some refs to 'https://canders277@bitbucket.org/ticha/tei-
docs.git'
hint: Updates were rejected because the tip of your current branch is behind
hint: its remote counterpart. Integrate the remote changes (e.g.
hint: 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
Completed with errors, see above
```

Figure 10. Error: pushing from a branch not up-to-date.

Second, if you pull before you have committed your own changes, your edits may be discarded. Sourcetree will give you a warning before this happens, but it is good to commit any changes before pulling.



```
git -c diff.mnemonicprefix=false -c core.quotepath=false -c
credential.helper=sourcetree fetch origin


git -c diff.mnemonicprefix=false -c core.quotepath=false -c
credential.helper=sourcetree pull origin master
From https://bitbucket.org/ticha/tei-docs
 * branch            master     -> FETCH_HEAD
error: Your local changes to the following files would be overwritten by merge:
    arte_transcriptionclean.xml
Please, commit your changes or stash them before you can merge.
error: The following untracked working tree files would be overwritten by merge:
    Tl675T_example doc.xml
    Tl675T_test.xml
Please move or remove them before you can merge.
Aborting
```

Figure 11. Warning: uncommitted changes.

Merge conflicts

Most of the difficulty in using version control comes from **conflicts** between copies.

Conflicts arise when two people edit the same section. While version control software automatically merges the changes that simultaneous users make to the document, it is difficult to resolve changes made to the same section. If two people make changes to the same section, the software does not know which changes to keep. Often, it will take the first changes pushed.

If you have made changes to the same section that someone else has just pushed changes to, when you try to commit Sourcetree will give you a warning message in the commit message box that your copy conflicts with the master branch. This is a bad situation.

Stashing changes

The best solution to this situation is to use stashing. **Stashing** allows you to save local changes in a separate location, merge with the master, and then reapply the stashed changes. If you have already committed your changes, you will need to roll back your commit:

1. Right-click on your commit and select Reverse commit.

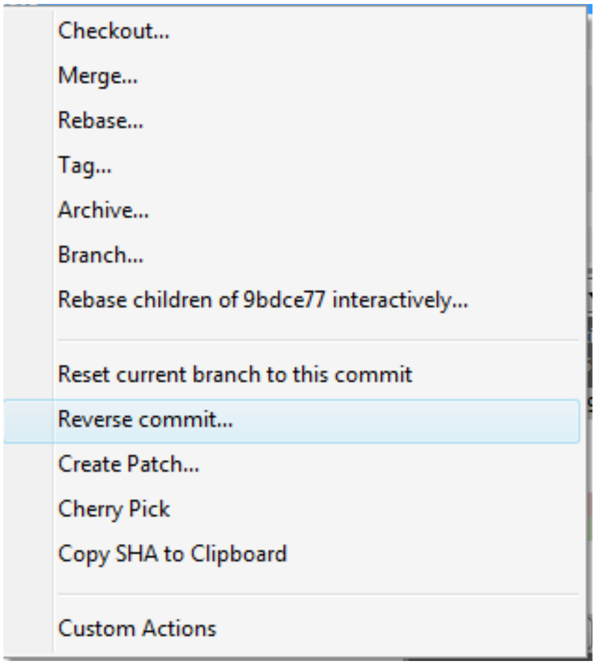
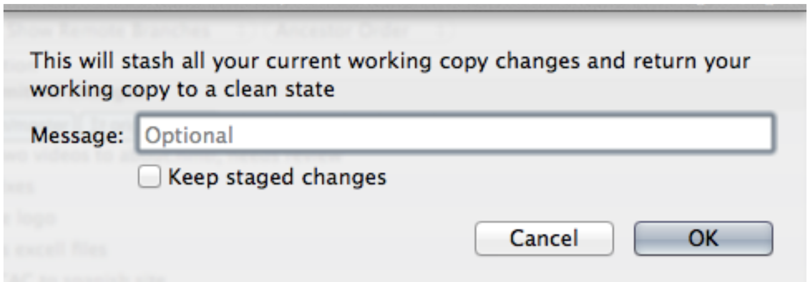


Figure 12. Reversing a commit.

2. Next, click the stash button across the top of Sourcetree.

3. Stash your changes and name the stash. This is essentially hiding away the changes you have made, so that you can reapply them later.



This will stash all your current working copy changes and return your working copy to a clean state

Message: Optional

☐ Keep staged changes

Figure 13. Stashing changes.

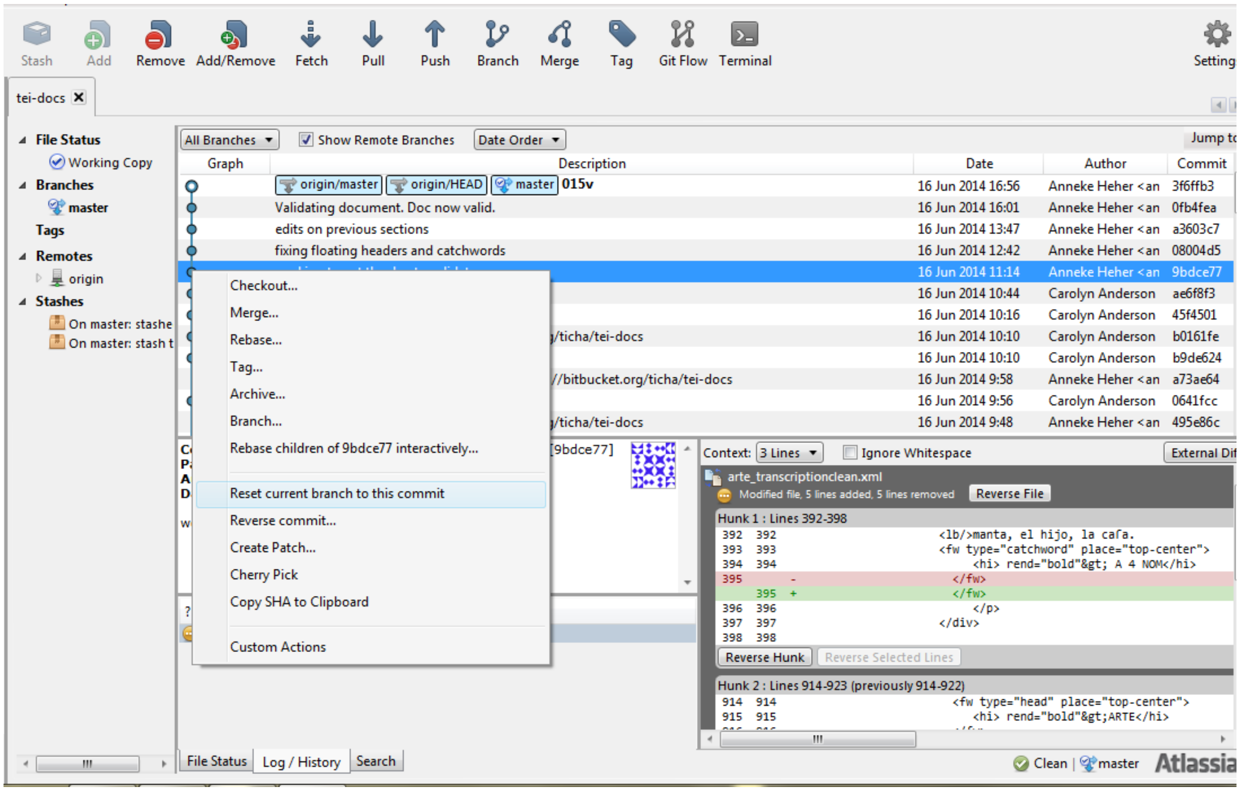
4. Now you should be able to pull.

5. After you are up-to-date, you should be able to reapply your changes from the stash.

Discarding changes

If stashing does not work, you may choose to discard your own changes:

1. Right-click on the most recent commit (the one that conflicts with your own changes) and select **Reset branch to this commit.**



Graph	Description	Date	Author	Commit
	origin/master origin/HEAD master 015v	16 Jun 2014 16:56	Anneke Heher <an	3f6ffb3
	Validating document. Doc now valid.	16 Jun 2014 16:01	Anneke Heher <an	0fb4fea
	edits on previous sections	16 Jun 2014 13:47	Anneke Heher <an	a3603c7
	fixing floating headers and catchwords	16 Jun 2014 12:42	Anneke Heher <an	08004d5
		16 Jun 2014 11:14	Anneke Heher <an	9bdce77
		16 Jun 2014 10:44	Carolyn Anderson	ae6f8f3
		16 Jun 2014 10:16	Carolyn Anderson	45f4501
	/ticha/tei-docs	16 Jun 2014 10:10	Carolyn Anderson	b0161fe
		16 Jun 2014 10:10	Carolyn Anderson	b9de624
	//bitbucket.org/ticha/tei-docs	16 Jun 2014 9:58	Anneke Heher <an	a73ae64
		16 Jun 2014 9:56	Carolyn Anderson	0641fcc
	/ticha/tei-docs	16 Jun 2014 9:48	Anneke Heher <an	495e86c

[9bdce77]

arte_transcriptionclean.xml

Modified file, 5 lines added, 5 lines removed

Hunk 1 : Lines 392-398

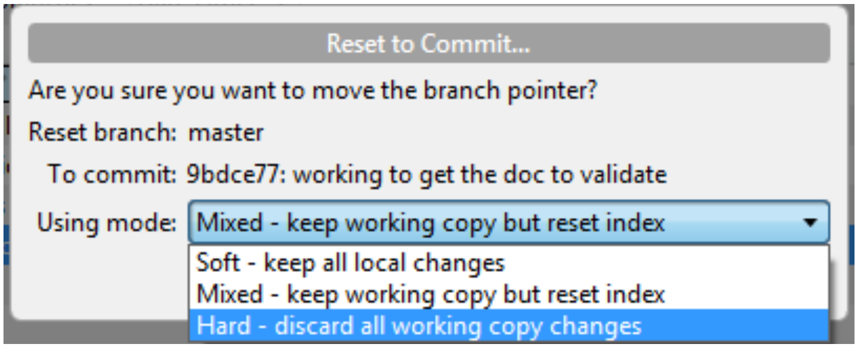
```
392  392                  <lb/>manta, el hijo, la cafa.
393  393                  <fw type="catchword" place="top-center">
394  394                       <hi> rend="bold"&gt; A 4 NOM</hi>
395          -              </fw>
     395     +              </fw>
396  396                       </p>
397  397                  </div>
398  398
```

Hunk 2 : Lines 914-923 (previously 914-922)

```
914  914                    <fw type="head" place="top-center">
915  915                       <hi> rend="bold"&gt;ARTE</hi>
```

Figure 14. Fixing a conflict by resetting to previous commit.

2. Select the option **Hard – discard all working copy changes.**



Reset to Commit...

Are you sure you want to move the branch pointer?

Reset branch: master

To commit: 9bdce77: working to get the doc to validate

Using mode: Mixed - keep working copy but reset index

Soft - keep all local changes
Mixed - keep working copy but reset index
Hard - discard all working copy changes

Figure 15. Discarding working copy changes.

Another solution is to have the other person roll back their changes. They should follow the instructions above, but click on the commit just prior to their conflicted commit.

Either solution results in lost time and work. It is much simpler to avoid this situation by communicating ahead of time about which section you are editing. ***Version control does not eliminate the need to communicate about where you are working.***