

Version Control

EOAS Software Carpentry Workshop

September 20th, 2016

Automated Version Control

Learning Goals

1. Understand the benefits of an automated version control system.
2. Understand the basics of how Mercurial works

"FINAL".doc



FINAL.doc!



FINAL_rev.2.doc



FINAL_rev.6.COMMENTS.doc



FINAL_rev.8.comments5.
CORRECTIONS.doc



FINAL_rev.18.comments7.
corrections9.MORE.30.doc



FINAL_rev.22.comments49.
corrections.10.##\$%WHYDID
ICOMETOGRADSCHOOL????.doc



"Piled Higher and Deeper" by Jorge Cham,
<http://www.phdcomics.com>

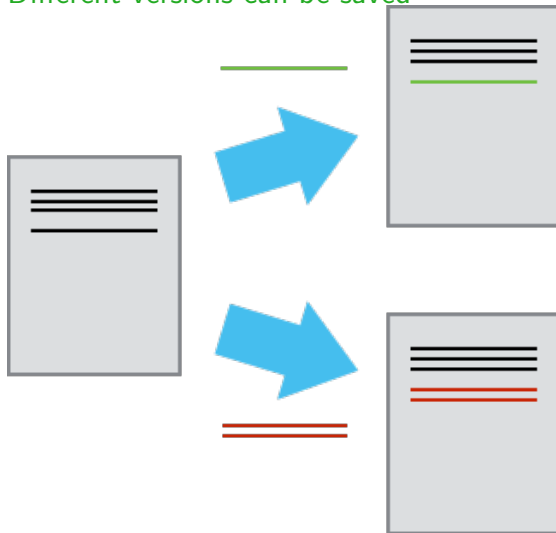
Automated Version Control

Changes are saved sequentially



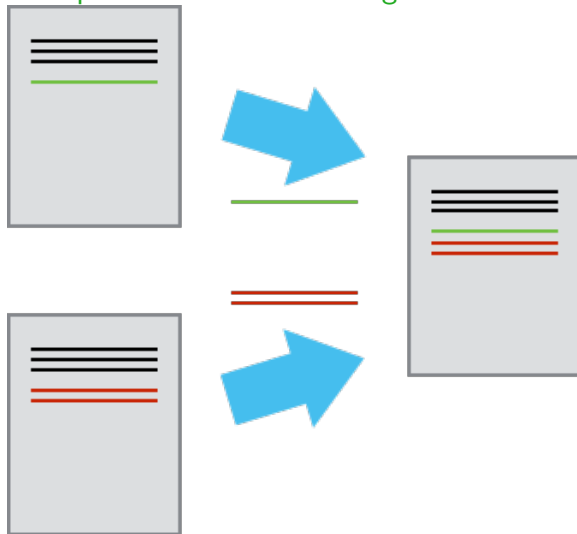
Automated Version Control

Different versions can be saved



Automated Version Control

Multiple versions can be merged



Configuring Mercurial

```
$ EDITOR=nano hg config --edit
```

```
[ui]
```

```
username = Vlad Dracula <vlad@tran.sylvan.ia>
```

```
editor = nano
```

```
[extensions]
```

```
color =
```

```
[color]
```

```
mode = win32
```

Creating a Repository

Learning Goal

1. Explain how to initialize a new Mercurial repository.

Lesson Commands

- mkdir forecast
- cd forecast
- hg init
- ls -a
- hg verify

Tracking Files

Learning Goals

1. Display the version control status of files in a repository and explain what those statuses mean.
2. Add files to Mercurial's collection of tracked files.
3. Record metadata about changes to a file.
4. Display the history of changes to files in a repository and explain the metadata that is recorded with each changeset.

Lesson Commands

- nano plan.txt
- hg status
- hg add plan.txt
- hg commit -m "Starting to plan the daily NEMO forecast system."
- hg log

Making Changes

Learning Goals

1. Display the uncommitted changes that have been made to tracked files.
2. Go through the modify-commit cycle for single and multiple files.

Lesson Commands

- nano plan.txt
- hg status
- hg diff
- hg commit -m "Note about atmospheric forcing."
- nano biblio.txt
- hg add biblio.txt
- hg commit -m "Added citation" biblio.txt

Exercise

Create a new Mercurial repository on your computer called `bio`. Write a three-line biography for yourself in a file called `me.txt`, commit your changes, then modify one line and add a fourth and display the differences between its updated state and its original state.

Exploring History

Learning Goals

1. Compare files with older versions of themselves.
2. Display the changes that were made to files in a previous changeset.

Lesson Commands

- `hg diff --rev 1:2 plan.txt`
- `hg diff -r 0:2 plan.txt`
- `hg diff --change 1`

Recovering Old Versions

Learning Goals

1. Restore older versions of files.
2. Use configuration aliases to create custom Mercurial commands.

Lesson Commands

- nano plan.txt
- hg revert --rev 0 plan.txt
- hg revert plan.txt
- hg status

Ignoring Things

Learning Goal

1. Configure Mercurial to ignore specific files and explain why it is sometimes useful to do so.

Lesson Commands

- `mkdir inprogress`
- `touch plan.txt inprogress/a.out inprogress/b.out`
- `hg status`
- `nano .hgignore`
- `hg status --ignored`

.hgignore

```
syntax: glob  
*~  
inprogress/
```

Ignoring Things

Learning Goal

1. Configure Mercurial to ignore specific files and explain why it is sometimes useful to do so.

Lesson Commands

- `mkdir inprogress`
- `touch plan.txt inprogress/a.out inprogress/b.out`
- `hg status`
- `nano .hgignore`
- `hg status --ignored`

Remote Repositories

Learning Goals

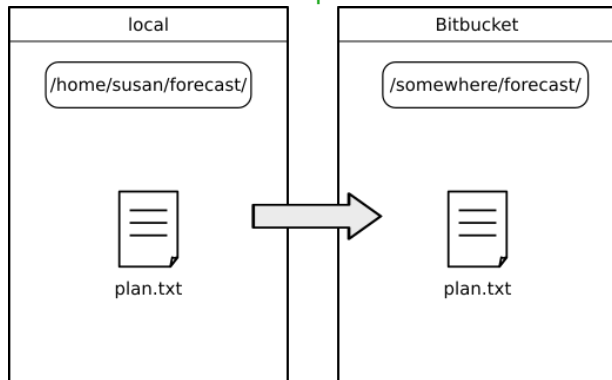
1. Explain what remote repositories are and why they are useful.
2. Explain what happens when a remote repository is cloned.
3. Explain what happens when changes are pushed to or pulled from a remote repository.

Lesson Commands

- `hg push`
- `hg config --local`
- `hg paths`
- `hg pull`

Remote Repositories

Local and Bitbucket Repos After 1st Push



Remote Repositories

Learning Goals

1. Explain what remote repositories are and why they are useful.
2. Explain what happens when a remote repository is cloned.
3. Explain what happens when changes are pushed to or pulled from a remote repository.

Lesson Commands

- `hg push`
- `hg config --local`
- `hg paths`
- `hg pull`

Exercise

Create a repository on Bitbucket, clone it, add a file, push those changes to Bitbucket. Look at the timestamp of the change on Bitbucket. How does Bitbucket record times, and why?

Working with Clone Repositories

Learning Goals

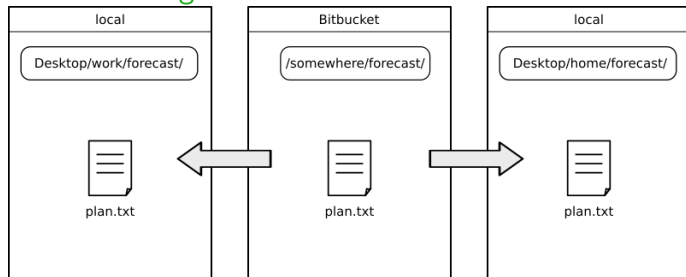
1. Explain how to push, pull, update files, and update metadata among clones of a repository.
2. Display a simple visualization of the state of a repository and explain how updating the repository affects its state.

Lesson Commands

- `hg clone`
- `hg add`
- `hg commit`
- `hg push`
- `hg pull`
- `hg log --graph`
- `hg update`

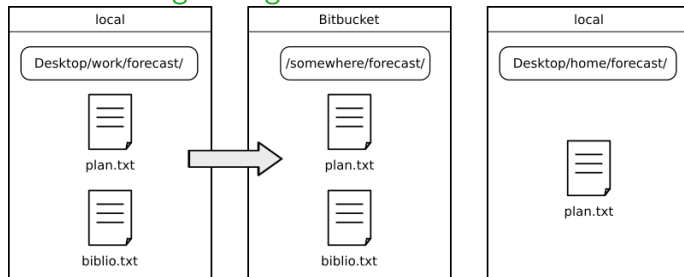
Working with Clone Repositories

After Creating work and home Clones



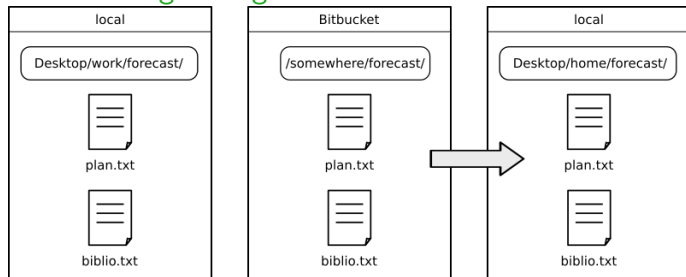
Working with Clone Repositories

After Pushing Change from work Clone



Working with Clone Repositories

After Pulling Change into home Clone



Working with Clone Repositories

Learning Goals

1. Explain how to push, pull, update files, and update metadata among clones of a repository.
2. Display a simple visualization of the state of a repository and explain how updating the repository affects its state.

Lesson Commands

- `hg clone`
- `hg add`
- `hg commit`
- `hg push`
- `hg pull`
- `hg log --graph`
- `hg update`

Collaboration

Learning Goals

1. Explain the differences between public and private repositories on Bitbucket.
2. Configure user and group access settings for Bitbucket repositories.

Merging Changes from Different Clones

Learning Goals

1. Explain how Mercurial handles changes that make a repository's history diverge.
2. Explain what merges are.

Lesson Commands

- hg commit
- hg push
- hg pull
- hg heads
- hg log -G
- hg merge
- hg status
- hg diff
- hg summary

Merge Conflicts

Learning Goals

1. Explain what merge conflicts are and when they can occur.
2. Resolve conflicts resulting from a merge using the KDiff3 tool.

Lesson Commands

- `hg incoming`
- `hg pull`
- `hg update`
- `hg log --graph`
- `hg merge --tool=kdiff3`