RESEARCH TOOLS 2011

VIDEO 19

2011-Nov-27
Kurt Schwehr
http://schwehr.org

UNH CCOM/JHC
Mercurial (hg) for distributed version control

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Video 19: Mercurial (hg) for revision control

Research Tools
2011-Nov-27
Kurt Schwehr
UNH CCOM/JHC

Examining a repository on Bitbucket...
* Examining a repository locally...
* Creating a repository...
* Looking at older versions and changes...
* Dealing with deleted files...
* What makes it a Mercurial tree?
* Introduction

- email is not a proper backup system
- local only systems like TimeMachine are good, but not enough
- DropBox and the like with some copies of older files is not enough

This will be just the basics of Mercurial for version control.

** Free Open Source Software (FOSS) Revision Control Systems (RCS)...
** Why mercurial?...
** See Also...
** Installing mercurial...
* Using someone else's repository...
* Examining a repository on BitBucket...
* Examining a repository locally...
* Creating a repository...
* Looking at older versions and changes...
* Dealing with deleted files...
* What makes it a Mercurial tree?...
* Adding directories...
* Using Mercurial inside of emacs...

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video-19-mercurial-hg-dvcs.org  Bot L15  Hg-21 (Org)
** Free Open Source Software (FOSS) Revision Control Systems (RCS)

- Local only
  - Revision Control System (RCS)
- Central Server
  - Concurrent Versions System (CVS) [LINK: http://www.gnu.org/s/rcs/]
  - Apache Subversion (SVN)
- Patch management systems
  - Quilt
- Distributed Version Control Systems (DVCS)
  - arch
  - Bazaar (bzr)
  - git
  - Mercurial (hg)

** Why Mercurial?
** See Also...
** Installing Mercurial...
* Using someone else's repository...
* Examining a repository on BitBucket...
* Examining a repository locally...

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**video-19-mercurial-hg-dvcs.org**

SUBTREE (NO CHILDREN)
**Why mercurial?**

- CCOM's default
- Ability to work effectively while offline (e.g. at sea or in a plane)
- Centralized server not required

**Installing mercurial...**

* Using someone else's repository...
* Examining a repository on BitBucket...
* Examining a repository locally...
* Creating a repository...
* Looking at older versions and changes...
* Dealing with deleted files...
* What makes it a Mercurial tree?...
* Adding directories...
* Using Mercurial inside of emacs...
**Why mercurial?...**

**See Also**

- [http://hginit.com/](http://hginit.com/)
- [http://hgbook.red-bean.com/](http://hgbook.red-bean.com/)

**Installing mercurial...**

* Using someone else’s repository...
* Examining a repository on BitBucket...
* Examining a repository locally...
* Creating a repository...
* Looking at older versions and changes...
* Dealing with deleted files...
Hg Init: a Mercurial tutorial by Joel Spolsky - Mozilla Firefox

Hg Init: a Mercurial tutorial

Mercurial is a modern, open source, distributed version control system, a compelling upgrade from older systems like Subversion. In this user-friendly, six-part tutorial, Joel Spolsky teaches you the key concepts.
* Introduction...
* Using someone else's repository

As shown in class many times, you can =clone= someone else's repository and follow their code by getting updates with the =pull= command. For example, clone my research tools course repository from https://bitbucket.org/schwehr/researchtools

```sh
# BEGIN_SRC sh
cd ~/
mkdir projects
cd projects
hg clone https://bitbucket.org/schwehr/researchtools
# END_SRC

To do updates, do

```sh
# BEGIN_SRC sh
cd ~/projects/researchtools
hg pull  # Bring the changes down to the local "repo"
hg update # Change the working files to have the latest changes
# END_SRC
```
We're planning scheduled maintenance at 9:00PM, 27 November 2011 (UTC-05:00).

schwehr is sharing code with you
Bitbucket is a code hosting site. Unlimited public and private repositories. Free for small teams.

Overview Downloads (0) Pull requests (0) Source Commits
branches » tags »


Sunday, November 27, 11
researchtools@ubuntu:~$ cd ~/
researchtools@ubuntu:~$ pwd
/home/researchtools
researchtools@ubuntu:~$ mkdir projects
mkdir: cannot create directory `projects': File exists
researchtools@ubuntu:~$ cd projects/
researchtools@ubuntu:~/projects$ ls -l
total 4
drw-r-xr-x 8 researchtools researchtools 4096 2011-11-27 17:26 researchtools
researchtools@ubuntu:~/projects$ mv researchtools old-re

#BEGIN_SRC sh

cd ~/
mkdir projects
cd projects
hg clone https://bitbucket.org/schwehr/researchtools
#END_SRC

To do updates, do

#BEGIN_SRC sh

cd ~/projects/researchtools
hg pull  # Bring the changes down to the local "repo"
hg update # Change the working files to have the latest changes
#END_SRC
Course material for the UNH CCOM/JHC Research Tools course. This material was started during the Fall 2011 semester. Covers emacs with org-mode, Bash command line, Python, Proj, GDAL/OGR, QGIS, and much more. It tries to build a Linux and open source software base for students to build on. Please copy, remix and improve this material. License: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License

Clone this repository (size: 650.3 KB): HTTPS / SSH
$ hg clone https://bitbucket.org/schwehr/researchtools

Recent commits See more »
getting video/video-11-python-part-4-if-argv.org
getting video/video-12-python-part-5-while.org
getting video/video-13-python-gps-data.org
getting video/video-14-clean-up-nmea.org
getting video/video-15-matplotlib-part-1.org
getting video/video-16-python-signal-processing.org
getting video/video-17-emacs-replace-string.org
getting video/video-18-python-hdf-h5py.org
getting video/video-19-mercurial-hg-dvcs.org
76 files updated, 0 files merged, 0 files removed, 0 files unresolved
researchtools@ubuntu:~/projects$ ls
old-res researchtools
researchtools@ubuntu:~/projects$

Research tools, being the Fall 2011
semester. Covers emacs with org-mode, Bash command line, Python, Proj, GDAL/OGR, QGIS, and much more. It
tries to build a Linux and open source software base for students to build on. Please copy, remix and improve this
material. License: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License

Clone this repository (size: 650.3 KB): HTTPS / SSH
$ hg clone https://bitbucket.org/schwehr/researchtools

Recent commits See more »

Author  Revision  Message

hg update # Change the working files to have the latest changes
#:END_SRC

--- video-19-mercurial-hg-dvcs.org 11% L72  Hg-21 (Org)
Semester: Covers ethical and legal issues in software development, tries to build a Linux and open source software repository. License: Creative Commons Attribution-ShareAlike 3.0 Unported

Clone this repository (size: 650.3 KB)

$ hg clone https://bitbucket.org/schwehr/researchtools

To do updates, do

```bash
#BEGIN_SRC sh
hg pull  # Bring the changes down to the local "repo"
hg update # Change the working files to have the latest changes
#END_SRC```

---

video-19-mercurial-hg-dvcs.org 11% L81  Hg-21 (Org)
pulling from https://bitbucket.org/schwehr/researchtools
searching for changes
no changes found
researchtools@ubuntu:~/projects/researchtools$ hg update
resolving manifests
0 files updated, 0 files merged, 0 files removed, 0 files unresolved
researchtools@ubuntu:~/projects/researchtools$

cd projects
hg clone https://bitbucket.org/schwehr/researchtools
# END_SRC

To do updates, do

# BEGIN_SRC sh
hg pull  # Bring the changes down to the local "repo"
hg update # Change the working files to have the latest changes
# END_SRC

-------------

Sunday, November 27, 11
#!/bin/bash

# Kurt Schwehr - Sept 2011
# BSD License
# Warning: This will not work for a Mac or Windows desktop

while [ true ]
  do
    echo $(date +"%H%M%S").png
    # Use ImageMagick / GraphicsMagick to grab the X11 screen.
    import -window root $(date +"%H%M%S").png
    sleep 5

done
<table>
<thead>
<tr>
<th>Author</th>
<th>Revision</th>
<th>Message</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>schwehr</td>
<td>c174c845e9df</td>
<td>more stuff to do</td>
<td>22 minutes</td>
</tr>
<tr>
<td>schwehr</td>
<td>cabcb5aaff6e</td>
<td>about to make the video</td>
<td>22 minutes</td>
</tr>
<tr>
<td>schwehr</td>
<td>1c02f28342e1</td>
<td>initial version plus comments</td>
<td>4 hours</td>
</tr>
<tr>
<td>schwehr</td>
<td>0b8518502ced</td>
<td>cleanup of class 24, moving unfinished to 26</td>
<td>3 days ago</td>
</tr>
<tr>
<td>schwehr</td>
<td>7fd8d728178a</td>
<td>added histories and final code</td>
<td>3 days ago</td>
</tr>
<tr>
<td>schwehr</td>
<td>3ef9dbd6b748</td>
<td>the students in researchtools are too quick</td>
<td>5 days ago</td>
</tr>
<tr>
<td>schwehr</td>
<td>1b5a01ac532c</td>
<td>sql writing</td>
<td>5 days ago</td>
</tr>
<tr>
<td>schwehr</td>
<td>8f06e59d3f79</td>
<td>using argparse and writing kml</td>
<td>5 days ago</td>
</tr>
<tr>
<td>schwehr</td>
<td>f034adf55e4</td>
<td>figures including what is gis</td>
<td>5 days ago</td>
</tr>
<tr>
<td></td>
<td>09a77e67db64</td>
<td>Trying to make the repo simpler to update via hg.</td>
<td>8 days ago</td>
</tr>
</tbody>
</table>
@@ -22,6 +22,10 @@
 22 - psearch name* type
 23 - ipython bookmark
 24 - filenames = !ls *.bag | sort
 25 - pycat
 26 - save filename 1-5 8 # Save to a script
 27 - ";" returns the return value in python
 28
 29 @@ -31,7 +35,7 @@
 30 * Please do not
 31
 32 Goals
 33
 34 - [] using argparse to handle the command line
 35 - [] add an option to the command line
 36 - [] saving binary data to matlab format. Read it in octave
 37 - [] using numpy to save the file
 38 ...
Pulling from https://bitbucket.org/schwehr/researchtools
rts config setting)
searching for changes
no changes found
researchtools@ubuntu:~/projects/researchtools$ hg update
resolving manifests
0 files updated, 0 files merged, 0 files removed, 0 files unresolved
researchtools@ubuntu:~/projects/researchtools$ ls
class dotfiles general Makefile scripts video
researchtools@ubuntu:~/projects/researchtools$ hg --help | less

* Examining a repository locally

#+BEGIN_SRC sh
cd ~/projects/researchtools
hg --help
hg log | less
#+END_SRC

#+BEGIN_SRC sh

#+END_SRC

---------------- video-19-mercurial-hg-dvcs.org 42% L97 Hg-21 (Org) ----------------
changeset: 22:c174c845e9df
tag: tip
user: Kurt Schwehr <schwehr@gmail.com>
date: Sun Nov 27 17:24:37 2011 -0500
files: class/26-python-binary-files-part-5.org
description:
more stuff to do

changeset: 21:cbacb5aaff6e
user: Kurt Schwehr <schwehr@gmail.com>
date: Sun Nov 27 17:24:00 2011 -0500
files: video/video-19-mercurial-hg-dvcs.org
description:
about to make the video

cd ~/projects/researchtools
hg --help
hg log | less
#+END_SRC

#+BEGIN_SRC sh

#+END_SRC

---
video-19-mercurial-hg-dvcs.org 42% L97 Hg-21 (Org)---
```
researchtools@ubuntu:~/projects/rtstudent
researchtools@ubuntu:~/projects/rtstudent$ cd rtstudent
researchtools@ubuntu:~/projects/rtstudent$ hg status
researchtools@ubuntu:~/projects/rtstudent$ hg log
researchtools@ubuntu:~/projects/rtstudent$ touch README.txt
researchtools@ubuntu:~/projects/rtstudent$ ls -l
total 0
-rw-r--r-- 1 researchtools researchtools 0 2011-11-27 17:52 README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg status
? README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg add README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg status
A README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg commit -m "empty file to start the project"
abort: no username supplied (see "hg help config")
researchtools@ubuntu:~/projects/rtstudent$ hg help config | less
hg status
hg log
touch README.txt
hg status
hg add README.txt
hg commit -m "empty file to start the project"
# Oops... it complains about no username
hg help config | less
```
The configuration files for Mercurial use a simple ini-file format. A configuration file consists of sections, led by a "[section]" header and followed by "name = value" entries:

```
[u1]
username = Firstname Lastname <firstname.lastname@example.net>
verbose = True
```

The above entries will be referred to as "ui.username" and "ui.verbose", respectively. Please see the hgrc man page for a full description of the possible configuration values:

- on Unix-like systems: "man hgrc"
- online: http://www.selenic.com/mercurial/hgrc.5.html

(END)
The configuration files for Mercurial are configuration files that contain information about Mercurial. Each configuration file consists of `name = value` entries, followed by "name = value" entries, etc.

```
[u1]
  username = Kurt Schwehr <schwehr@gmail.com>
  verbose = True
  editor = emacs
```

The above entries will be referenced in various places. Please see the [Mercurial documentation](http://www.selenic.com) for a list of possible configuration values.

On Unix-like systems, `man hg` gives an overview of Mercurial features.

- online: [http://www.selenic.com](http://www.selenic.com)

---

Now you can commit your changes:

```
Wrote /home/researchtools/.hgrc
```

Edited: [video-19-mercurial-hg-dvcs.org](http://www.selenic.com) 65% L134 Hg-21 (Org)
researchtools@ubuntu:~/projects/rtstudent$ hg help config | less
researchtools@ubuntu:~/projects/rtstudent$ hg commit -m "empty file to start the project"

README.txt
committed changeset 0:5e5a7b9800b62
researchtools@ubuntu:~/projects/rtstudent$ hg log README.txt
changeset: 0:5e5a7b9800b62
tag: tip
user: Kurt Schwehr <schwehr@gmail.com>
date: Sun Nov 27 17:56:52 2011 -0500
files: README.txt
description: empty file to start the project

researchtools@ubuntu:~/projects/rtstudent$

Now you can commit your changes:

```sh
# BEGIN_SRC
hg commit -m "empty file to start the project"
hg log README.txt
# END_SRC
```

---

video-19-mercurial-hg-dvcs.org 68% L142 Hg-21 (Org)
This is a place for research tools work by students. This is me working through classes and videos.

empty file to start the project

Now edit your README.txt file and add a few lines.
researchtools@ubuntu:~/projects/rtstudent$ hg status
M README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg diff
diff -r 5e5a7b980b62 README.txt
--- a/README.txt  Sun Nov 27 17:56:52 2011 -0500
+++ b/README.txt  Sun Nov 27 17:59:02 2011 -0500
@@ -0,0 +1,2 @@
+This is a place for research tools work by students. This is me working
+through classes and videos.
researchtools@ubuntu:~/projects/rtstudent$ hg commit -m "Intro lines with basic
description"
README.txt
committed changeset 1:78a9a335ef6e
researchtools@ubuntu:~/projects/rtstudent$ hg log README.txt
hg diff
hg commit -m "Intro lines with basic description"
hg log
#BEGIN_SRC sh

Now make another edit to the README.txt file.

#END_SRC

---

video-19-mercurial-hg-dvcs.org  71% L155  Hg-21 (Org)
This is a place for research tools work by students. This is me working through classes and videos.

-kurt 2011-Nov-27

Now make another edit to the README.txt file.

```sh
hg status
hg diff
hg commit -m "sign the file"
```

* Looking at older versions and changes...

Wrote /home/researchtools/projects/rtstudent/README.txt
Intro lines with basic description

changeset: 0:5e5a7b980b62
user: Kurt Schwehr <schwehr@gmail.com>
date: Sun Nov 27 17:56:52 2011 -0500
files: README.txt
description:
empty file to start the project

researchtools@ubuntu:~/projects/rtstudent$ hg commit -m "sign the file"

researchtools@ubuntu:~/projects/rtstudent$ cd ~/projects/rtstudent

hg log
hg cat --rev 0 README.txt
hg cat README.txt
hg cat --rev 1 README.txt
hg cat --rev 2 README.txt
hg diff -r 1:2 README.txt

++END_SRC

video-19-mercurial-hg-dvcs.org 73% L166 Hg-21 (Org)--------------------------
This is a place for research tools work by students. This is me working through classes and videos.

-kurt 2011-Nov-27

This is a place for research tools work by students. This is me working through classes and videos.

-kurt 2011-Nov-27

--- END_SRC ---

*

video-19-mercurial-hg-dvcs.org  73% L166  Hg-21 (Org)  

--- END_SRC ---

--- END_SRC ---
researchtools@ubuntu:~/projects/rtstudent$ ls -l
total 4
-rw-r--r-- 1 researchtools researchtools 120 2011-11-27 18:00 README.txt
researchtools@ubuntu:~/projects/rtstudent$ rm README.txt
rm: remove regular file `README.txt'? y
researchtools@ubuntu:~/projects/rtstudent$ hg status
! README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg revert README.txt
reverting README.txt
researchtools@ubuntu:~/projects/rtstudent$ ls -l
total 4
-rw-r--r-- 1 researchtools researchtools 120 2011-11-27 18:03 README.txt
researchtools@ubuntu:~/projects/rtstudent$ less README.txt

#BEGIN_SRC sh
cd ~/projects/rtstudent
rm README.txt
hg status
hg revert README.txt
hg status
#END_SRC

video-19-mercurial-hg-dvcs.org 76% L178 Hg-21 (Org)
researchtools@ubuntu:~/projects/rtstudent$ ls -l
-rw-r--r-- 1 researchtools researchtools 120 2011-11-27 18:03 README.txt
researchtools@ubuntu:~/projects/rtstudent$ less README.txt
researchtools@ubuntu:~/projects/rtstudent$ hg status
researchtools@ubuntu:~/projects/rtstudent$ ls -la
 total 4
 drwxr-xr-x 3 researchtools researchtools 4096 2011-11-27 18:04 .
 drwxr-xr-x 5 researchtools researchtools 4096 2011-11-27 17:51 ..
 drwxr-xr-x 3 researchtools researchtools 4096 2011-11-27 18:04 .hg
-rw-r--r-- 1 researchtools researchtools 120 2011-11-27 18:03 README.txt
researchtools@ubuntu:~/projects/rtstudent$ du .hg
  8 .hg/store/data
 28 .hg/store
 68 .hg
researchtools@ubuntu:~/projects/rtstudent$ ls -l
 cd ~/projects/rtstudent
 ls -la
 du .hg
 ls -l .hg
 #+END_SRC

* Adding directories...
* Using Mercurial inside of emacs...

--- video-19-mercurial-hg-dvcs.org Bot L189 Hg-21 (Org)------------------------

SUBTREE (NO CHILDREN)
researchtools@ubuntu:~/projects/rtstudent

```bash
researchtools@ubuntu:~/projects/rtstudent$ ls -l .hg
total 40
-rw-r--r-- 1 researchtools researchtools 57 2011-11-27 17:51 00changelog.i
-rw-r--r-- 1 researchtools researchtools 92 2011-11-27 18:00 branchheads.cache
-rw-r--r-- 1 researchtools researchtools 67 2011-11-27 18:04 dirstate
-rw-r--r-- 1 researchtools researchtools 13 2011-11-27 18:00 last-message.txt
-rw-r--r-- 1 researchtools researchtools 33 2011-11-27 17:51 requires
drwxr-xr-x 3 researchtools researchtools 4096 2011-11-27 18:00 store
-rw-r--r-- 1 researchtools researchtools 44 2011-11-27 18:01 tags.cache
-rw-r--r-- 1 researchtools researchtools 7 2011-11-27 18:00 undo.branch
-rw-r--r-- 1 researchtools researchtools 9 2011-11-27 18:00 undo.desc
-rw-r--r-- 1 researchtools researchtools 67 2011-11-27 18:00 undo.dirstate
researchtools@ubuntu:~/projects/rtstudent$ mkdir -p class/01
researchtools@ubuntu:~/projects/rtstudent$ mkdir -p class/02
researchtools@ubuntu:~/projects/rtstudent$ mkdir -p class/0{3,4,5,6}
researchtools@ubuntu:~/projects/rtstudent$
```

```

cd ~/projects/rtstudent
mkdir -p class/01
mkdir -p class/02
mkdir -p class/0{3,4,5,6}
hg add class
#+END_SRC
```

---

* Using Mercurial inside of emacs...* 

---

`video-19-mercurial-hg-dvcs.org` Bot L198 Hg-21 (Org) ---

Sunday, November 27, 11
* Using Mercurial inside of emacs

There is one main command to know for using revision control systems in emacs (thanks to ESR) that adds a file to a version control system and commits changes. If the directory is under mercurial control, it will add the file to version control. If not, it will default to using the very old RCS software.

```bash
#BEGIN EXAMPLE

Registering (/home/researchtools/projects/rtstudent/another-file.txt)... done
```
a file for mercurial

another change

a second change for emacs
a file for mercurial
another change

Changeset: 4:46c6955acc
---
tag: tip
user: Kurt Schwehr <schwehr@gmail.com>
date: Sun Nov 27 18:07:37 2011 -0500
files: another-file.txt
description:
a second change for emacs

Changeset: 3:2ae247852e94
---

<table>
<thead>
<tr>
<th>Command</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-x v l</td>
<td>will show the log</td>
</tr>
<tr>
<td>C-x v =</td>
<td>shows changes in a file</td>
</tr>
<tr>
<td>C-x v~</td>
<td>Show other version</td>
</tr>
</tbody>
</table>

a file for mercurial

another change

modified

---

video-19-mercurial-hg-dvcs.org

---

*vc-diff*

| a/another-file.txt | Sun Nov 27 18:07:37 2011 -0500 |
| b/another-file.txt | Sun Nov 27 18:08:36 2011 -0500 |

@@ -2,3 +2,5 @@

another change

+ modified +

---

video-19-mercurial-hg-dvcs.org

---

*vc-diff*

| All L2 | (Diff from a/another-file.txt) |

---

Sunday, November 27, 11
a file for mercurial

another change

modified

--- another-file.txt  Sun Nov 27 18:07:37 2011 -0500
+++ b/another-file.txt  Sun Nov 27 18:08:36 2011 -0500
@@ -2,3 +2,5 @@

another change

+modified
+
Command | Action
---------|---------
C-x v l | will show the
C-x v = | shows changes
C-x v~  | Show other ver

*vc-change-log*

a file for mercurial
another change
modified

changeset: 4:4e6ced955acc
tag:       tip
user:      Kurt Schwehr <schwehr@gmail.com>
date:      Sun Nov 27 18:07:37 2011 -0500
files:     another-file.txt
description:
a second change for emacs
<table>
<thead>
<tr>
<th>Command</th>
<th>Action</th>
</tr>
</thead>
</table>
| C-x v l | will show the
| C-x v =  | shows changes
| C-x v~  | Show other ver

a file for mercurial

another change

modified

-U:--- another-file.txt   All L7   Hg:4   (Text yas)

a file for mercurial

-:%%% another-file.txt-3~   All L1   (Text yas)

Checking out /home/researchtools/projects/rtstudent/another-file.txt-3~...done