



Source Code Management: git and subversion (svn) compared.

Source Code Management



- What is it?
 - A computer system to help you manage:
 - code you write (eg. ruby, java, python source code).
 - text documents (eg. HTML files).
 - anything requiring revision tracking (eg. contracts v.1.1).
- Why?
 - Track **revisions** (what changed between 0.2.3 and 0.2.4)
 - **Tag** releases (eg. wdot-0.2.4)

Using it: Some terms first



- Repository:
 - A place (server) where the source code is stored.
 - The repository has an address.
 - eg. <http://myserver.com/svn/myproject>
 - eg. `myserver:/myfolder/myproject`
- Working copy:
 - Your copy of the code you make edits to.

Creating a repository



- Using subversion (svn). On the **server**:
 - svnadmin create path
 - eg. svnadmin create [repo/svn](#) or
 - eg. svnadmin create [/home/siuyin/repo/svn](#)

```
[siuyin@titan ~]$ svnadmin create repo/svn
```

```
[siuyin@titan ~]$ ls -F repo/svn  
conf/  dav/  db/  format  hooks/  locks/  README.txt
```

cat README.txt on svr

Work on your code



```
[siuyin@titan ~]$ mkdir myspace  
[siuyin@titan ~]$ mkdir myspace/myproj  
[siuyin@titan ~]$ cd myspace/myproj/  
[siuyin@titan myproj]$ vim README.svn
```

```
[siuyin@titan myproj]$ cat README.svn  
This is the readme file.
```

You can then file your code to the repository by:

```
svn import . svn+ssh://siuyin@localhost/home/siuyin/myrepo/svn
```

But **don't** do this -- yet.

Recommended Practice



- Create 3 directories/folders:
 - **trunk** – where the main development work is done.
 - **tags** – to store releases (eg. wdot-0.2.4)
 - **branches** – hold different “versions” of the mainline code (eg. wdot-lite or wdot-next-generation-test)

```
[siuyin@titan myspace]$ cd /home/siuyin/myspace/myproj/
```

```
[siuyin@titan myproj]$ mkdir trunk branches tags
```

```
[siuyin@titan myproj]$ mv README.svn trunk
```

Perform the import



- `svn import` files your code to your repository.

```
svn import . svn+ssh://siuyin@localhost/home/siuyin/repo/svn  
-m "Initial import."
```

```
siuyin@localhost's password:
```

```
Adding      trunk  
Adding      trunk/README.svn  
Adding      branches  
Adding      tags
```

Requested by ssh
over the **network**.

```
Committed revision 1.
```

Quick Review



- Set up an repository on a **server**.
 - `svnadmin create` <repository_path>
- Set up your source-code tree (**workstation**).
 - `trunk`, `tags` and `branches`.
- File your code into the the repository.
 - `svn import` <path> <repos_url> -m <log_message>

Using svn: working copy



```
[siuyin@titan myproj]$ cd /home/siuyin/myspace/  
[siuyin@titan myspace]$ mv myproj myproj-old  
[siuyin@titan myspace]$ svn co  
svn+ssh://siuyin@localhost/home/siuyin/repo/svn/trunk myproj  
siuyin@localhost's password:  
A      myproj/README.svn  
Checked out revision 1.
```

```
[siuyin@titan myspace]$ ls myproj  
README.svn
```

```
[siuyin@titan myspace]$ cd myproj  
[siuyin@titan myproj]$ vim README.svn  
[siuyin@titan myproj]$ cat README.svn  
This is the readme file.  
Added some text.
```

Committing changes



```
[siuyin@titan myproj]$ svn ci -m "Updated README.svn ."
siuyin@localhost's password:
Sending          README.svn
Transmitting file data .
Committed revision 2.
```

1

2

Environments include: Trac
and RedMine, Eclipse plug-in
subclipse

```
[siuyin@titan myproj]$ ls -a
.  ..  README.svn  .svn
```

Note:

1. No more long URLs – stored in `.svn`
There will be a `.svn` in every folder/sub-folder
2. `svn` has incremented the revision number to 2.

Adding files



```
[siuyin@titan myproj]$ vim hello.rb
[siuyin@titan myproj]$ cat hello.rb
#!/usr/bin/env ruby
puts "Hello from ruby."
[siuyin@titan myproj]$ svn st 1
?      hello.rb
[siuyin@titan myproj]$ svn add hello.rb
A      hello.rb
[siuyin@titan myproj]$ svn ci -m "Added hello.rb ."
siuyin@localhost's password:
Adding      hello.rb
Transmitting file data .
Committed revision 3.
```

Note 1: No password request for status and to add files ?

(re)moving files



```
[siuyin@titan myproj]$ mkdir src
[siuyin@titan myproj]$ svn add src
A          src
[siuyin@titan myproj]$ svn mv hello.rb src
A          src/hello.rb
D          hello.rb
[siuyin@titan myproj]$ svn ci -m
    "Created src, moved hello.rb into src."
siuyin@localhost's password:
Deleting          hello.rb
Adding           src
Adding           src/hello.rb
```

Committed revision 4.

Historical changes



```
[siuyin@titan myproj]$ svn log README.svn
siuyin@localhost's password:
```

```
-----
r2 | siuyin | 2008-10-17 12:18:22 +0800 (Fri, 17 Oct 2008) | 1 line
```

```
Updated README.svn .
```

```
-----
r1 | siuyin | 2008-10-17 11:52:39 +0800 (Fri, 17 Oct 2008) | 1 line
```

```
Initial import.
```

```
-----
[siuyin@titan myproj]$ svn diff -r1:2 README.svn
siuyin@localhost's password:
Index: README.svn
```

```
=====
--- README.svn (revision 1)
```

```
+++ README.svn (revision 2)
```

```
@@ -1 +1,2 @@
```

```
 This is the readme file.
```

```
+Added some text.
```

Tagging a release: Step 1



```
[siuyin@titan myproj]$ svn info
Path: .
URL: svn+ssh://siuyin@localhost/home/siuyin/repo/svn/trunk
Repository Root: svn+ssh://siuyin@localhost/home/siuyin/repo/svn
Repository UUID: 9d67c22b-e114-47ab-a09f-7ebf796945be
Revision: 1
Node Kind: directory
Schedule: normal
Last Changed Author: siuyin
Last Changed Rev: 1
Last Changed Date: 2008-10-17 11:52:39 +0800 (Fri, 17 Oct 2008)
```

```
[siuyin@titan myproj]$ svn ls
  svn+ssh://siuyin@localhost/home/siuyin/repo/svn
siuyin@localhost's password:
branches/
tags/
trunk/
```

Tagging a release: Step 2



```
svn cp
svn+ssh://siuyin@localhost/home/siuyin/repo/svn/trunk
svn+ssh://siuyin@localhost/home/siuyin/repo/svn/tags/myproj-0.1
-m "myproj release 0.1"
siuyin@localhost's password:
```

Committed **revision 5**.

```
[siuyin@titan myproj]$ vim README.svn
[siuyin@titan myproj]$ cat README.svn
This is the readme file.
Added some text.
Added even more stuff after v0.1 .
[siuyin@titan myproj]$ svn ci -m "Updated README.svn ."
siuyin@localhost's password:
Sending          README.svn
Transmitting file data .
Committed revision 6.
```

Retrieving a particular release



```
[siuyin@titan myproj]$ svn switch
  svn+ssh://siuyin@localhost/home/siuyin/repo/svn/tags/myproj-0.1
siuyin@localhost's password:
U    README.svn
Updated to revision 6.
[siuyin@titan myproj]$ cat README.svn
This is the readme file.
Added some text.
```

```
[siuyin@titan myproj]$ svn switch
  svn+ssh://siuyin@localhost/home/siuyin/repo/svn/trunk
siuyin@localhost's password:
U    README.svn
Updated to revision 6.
[siuyin@titan myproj]$ cat README.svn
This is the readme file.
Added some text.
Added even more stuff after v0.1 .
```

git - the stupid content tracker*



```
[siuyin@titan myspace]$ cd /home/siuyin/myspace/
[siuyin@titan myspace]$ mkdir mygit
[siuyin@titan myspace]$ cd mygit/
[siuyin@titan mygit]$ git init
Initialized empty Git repository in .git/
[siuyin@titan mygit]$ vim README.git
[siuyin@titan mygit]$ cat README.git
This is the readme file.
[siuyin@titan mygit]$ git add .
[siuyin@titan mygit]$ git commit -m "Initial commit."
Created initial commit b40a64b: Initial commit.
1 files changed, 1 insertions(+), 0 deletions(-)
create mode 100644 README.git
```

We now have a *local* git repository.

* taken directly from the manual page

Remote git repository



```
[siuyin@titan mygit]$ cd /home/siuyin/myspace/  
[siuyin@titan myspace]$ git clone --bare mygit git  
Initialized empty Git repository in /home/siuyin/myspace/git/  
remote: Generating pack...  
Done counting 3 objects.  
Deltifying 3 objects...  
 100% (3/3) done  
Total 3 remote: (delta 0), reused 0 (delta 0)  
Indexing 3 objects...  
 100% (3/3) done
```

```
[siuyin@titan myspace]$ scp -r git  
  siuyin@localhost:/home/siuyin/repo/git  
siuyin@localhost's password:
```

We now have a copy of your git repository
on the remote server.

git clone == svn co



```
[siuyin@titan myspace]$ mv mygit mygit-old
[siuyin@titan myspace]$ git clone
  siuyin@localhost:/home/siuyin/repo/git mygit
Initialized empty Git repository in
  /home/siuyin/myspace/mygit/.git/
siuyin@localhost's password:
remote: Generating pack...
remote: Done counting 3 objects.
Deltifying 3 objects...
 100% (3/3) done
Total 3 (delta 0), reused 3remote: (delta 0)
Indexing 3 objects...
 100% (3/3) done
```

```
[siuyin@titan myspace]$ ls -a mygit
.  ..  .git  README.git
```

git commit -a == svn ci



```
[siuyin@titan myspace]$ cd /home/siuyin/myspace/mygit
[siuyin@titan mygit]$ vim README.git
[siuyin@titan mygit]$ cat README.git
This is the readme file.
Added some text.
```

```
[siuyin@titan mygit]$ git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README.git
#
no changes added to commit (use "git add" and/or "git commit -a")
```

```
[siuyin@titan mygit]$ git commit -a -m "Updated README.git ."
Created commit e132c59: Updated README.git .
1 files changed, 1 insertions(+), 0 deletions(-)
```

git commit without network?!



```
[siuyin@titan mygit]$ vim README.git
```

```
[siuyin@titan mygit]$ cat README.git
```

This is the readme file.

Added some text.

Added more text.

```
[siuyin@titan mygit]$ git commit -a -m "Updated README.git ."
```

```
Created commit 88f6ae1: Updated README.git .
```

```
1 files changed, 1 insertions(+), 0 deletions(-)
```

Yes, but on local repository.

Now to push to the remote repository on the server.

```
[siuyin@titan mygit]$ git push
```

```
siuyin@localhost's password:
```

```
updating 'refs/heads/master'
```

```
from b40a64b3d0b614a355fe7b531ac8db5aa26d9d31
```

```
to 88f6ae1b2b449844e0f347fc94d0565cbcc55f09
```

```
Generating pack...
```

git: review thus far...



- **git repositories** can be **local** and / or **remote**.
- created using **git init** (or git-init).
- working copy “checked-out” using **git clone** .
- git commit, status, log, diff etc **do not need to connect** to remote repository.
- local and remote **synchronized** with **git push** .
 - will talk about git pull later.

git log



```
[siuyin@titan mygit]$ git log README.git
```

```
commit 88f6ae1b2b449844e0f347fc94d0565cbcc55f09
```

```
Author: Loh Siu Yin <siuyin@beyondbroadcast.com>
```

```
Date: Fri Oct 17 17:15:58 2008 +0800
```

Updated README.git .

```
commit e132c59230fd2eb652d54121fa98684772f5d027
```

```
Author: Loh Siu Yin <siuyin@beyondbroadcast.com>
```

```
Date: Fri Oct 17 17:08:41 2008 +0800
```

Updated README.git .

```
commit b40a64b3d0b614a355fe7b531ac8db5aa26d9d31
```

```
Author: Loh Siu Yin <siuyin@beyondbroadcast.com>
```

```
Date: Fri Oct 17 16:26:14 2008 +0800
```

Initial commit.

git diff



```
[siuyin@titan mygit]$ git diff e132 88f6
diff --git a/README.git b/README.git
index d5c26bb..ecad820 100644
--- a/README.git
+++ b/README.git
@@ -1,2 +1,3 @@
 This is the readme file.
 Added some text.
+Added more text.
```

A revision is specified by a 40 hex-digit SHA1 hash.
The hash is generated from the file-contents not the file-name.

Usually the first 4 to 6 digits is all that is
required to uniquely specify a revision.

git tag



```
[siuyin@titan mygit]$ cat README.git
```

```
This is the readme file.
```

```
Added some text.
```

```
Added more text.
```

```
[siuyin@titan mygit]$ git tag mygit-0.1
```

```
[siuyin@titan mygit]$ vim README.git
```

```
[siuyin@titan mygit]$ cat README.git
```

```
This is the readme file.
```

```
Added some text.
```

```
Added more text.
```

```
Added after release 0.1 .
```

```
[siuyin@titan mygit]$ git commit -a -m "Updated README.git ."
```

```
Created commit 0156b78: Updated README.git .
```

```
1 files changed, 1 insertions(+), 0 deletions(-)
```

git checkout == svn switch



```
[siuyin@titan mygit]$ git tag -l  
mygit-0.1
```

```
[siuyin@titan mygit]$ git checkout mygit-0.1  
Note: moving to "mygit-0.1" which isn't a local branch  
If you want to create a new branch...  
HEAD is now at 88f6ae1... Updated README.git .
```

```
[siuyin@titan mygit]$ cat README.git  
This is the readme file.  
Added some text.  
Added more text.
```

Next ..

Back to master



```
[siuyin@titan mygit]$ git checkout master
Previous HEAD position was 88f6ae1... Updated README.git .
Switched to branch "master"
```

```
[siuyin@titan mygit]$ cat README.git
This is the readme file.
Added some text.
Added more text.
Added after release 0.1 .
```

Remember to push your changes back to the remote repository.

```
[siuyin@titan mygit]$ git push
siuyin@localhost's password:
updating 'refs/heads/master'
  from 88f6ae1b2b449844e0f347fc94d0565cbcc55f09
  to    0156b7845d8ecde117f8d26abbafecd74342304a
Generating pack...
```

Collaboration



- Remote / central repository
 - so that others can `git clone` or `svn co` your code.
- Updates are sent back to central repository
 - `git commit -a` and `git push` or `svn ci`
- To update your working copy from the repository
 - `git pull` or `svn update`

Comparison



svn

Working Copy / Repository

Most operations require network access

History (log / diff) require network access.

tag / switch needs long URLs.

branch operations* require manual tracking.

svn more established, good MS Windows client.

git

local / remote repository

Most operations do not need network access

History (log / diff) available locally no network needed.

tag / checkout -- no long URLs.

branch operations* automatically tracked by git.

git less established, limited MS Windows support.

* not previously discussed.

Copyright © 2008, Loh Siu Yin <siuyin@beyondbroadcast.com>

This work is licensed under the Creative Commons Attribution-Non-Commercial-Share Alike License.



Source Code Management: git and subversion (svn) compared.

Loh Siu Yin
siuyin@beyondbroadcast.com