Using Git to Manage CogX KTH Code

Andrzej Pronobis

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1 Benefits of Using Git

- *Branches and tags are managed by Git.* Merging can be performed easily without the need to manually track the origins of the code and worry about the same code being merged multiple times.
- *Distributed repositories.* The work can be performed locally and off-line. Branching/merging/committing does not require connection to any central server.
- *Cheap (topic) branches.* Creating local branches e.g. for testing/implementing a feature, maintenance etc. is quick and easy. A workflow based on topic branches allows to create a higher quality code and maintain stability of the master branch.
- *Commits are uniquely identified by an SHA hash code.* The SHA code is calculated based on the contents of the commit and therefore is the same even for unrelated repositories.
- *Non-linear history.* Git tracks the history of all branches and merges.
- *Performance.* Git is fast.

2 Documentation

- Git Community Book
  `http://book.git-scm.com/`
- Git FAQ
  `http://git.or.cz/gitwiki/GitFaq`
- Git for the lazy
  `http://www.spheredev.org/wiki/Git_for_the_lazy`
- Git workflow for agile teams
  `http://reinh.com/blog/2009/03/02/a-git-workflow-for-agile-teams.html`
- Git for computer scientists
  `http://eagain.net/articles/git-for-computer-scientists/`

3 Installing Git

3.1 Ubuntu Linux

```
apt-get install git-core git-gui gitk
```

3.2 Windows

Full windows installer can be found at
`http://code.google.com/p/msysgit/downloads/list`

4 Setting Up the Local Repository

- Get access to the remote repository. Generate your public SSH key:

  ```
  ssh-keygen -t rsa
  ```

  and send the file `~/.ssh/id_rsa.pub` to the admin of the repository.

- Clone the remote repository into a local directory:

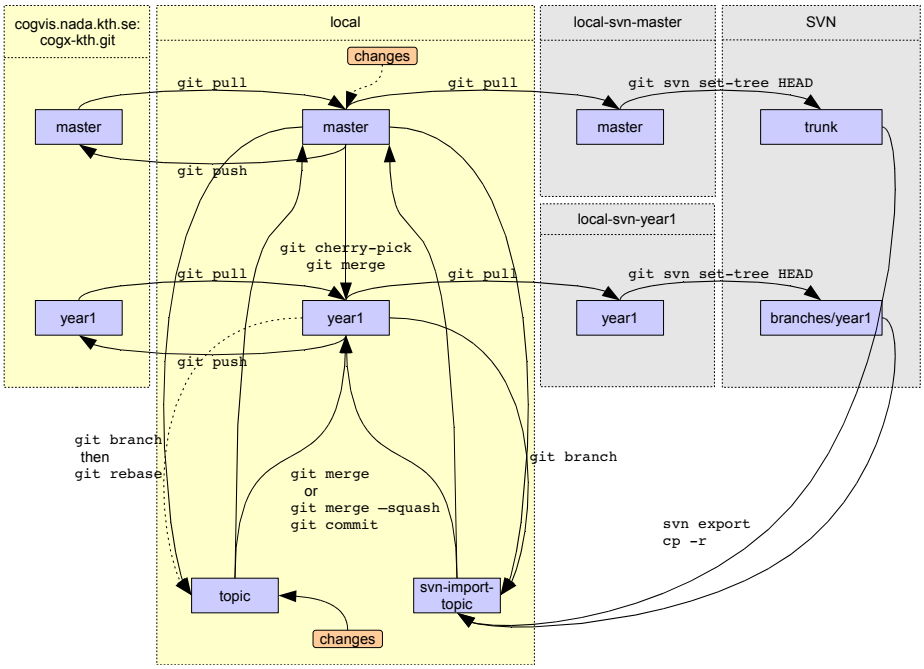
  ```
  git clone git@cogvis.nada.kth.se:cogx-kth.git
  ```

- Create local branches tracking the remote branches e.g. `year1`:

  ```
  git branch --track year1 origin/year1
  ```

5 Workflow for the CogX-KTH Code

5.1 Overview



5.2 Feature Development

- Checkout the master branch:

```
git checkout master
```

- Pull updates from the central server and merge them to master:

```
git pull
```

- Create and checkout a topic branch for the new feature:

```
git checkout -b topic
```

- Do some work in the topic branch:

```
echo "contents" > file
git add file
git commit -m "First commit"
echo "contents2" > file2
git add file2
git commit -m "Second commit"
```

- Merge with the master branch:

```
git checkout master
git merge --squash topic
git commit
```

- Push the changes upstream:

```
git push
```

- Do more work in the topic branch:

```
git checkout topic
echo "new contents" > file
git add file
git commit -m "Third commit"
```

- Pull some new updates from the central server and merge them to master:

```
git checkout master
git pull
```

- Rebase the topic branch against the new changes:

```
git checkout topic
git rebase master
```

- Merge the changes with the master branch:

```
git checkout master
git merge --squash topic
git commit
```

- Push the changes upstream:

```
git push
```

5.3 Pushing Changes to SVN

Missing

5.4 Pulling Changes from SVN

Missing

6 FAQ

1. How to list branches and check which branch is checked out?

```
git branch
```

2. How to list all branches including remote branches?

```
git branch -a
```

3. How to view history of a branch or all branches?

```
gitk
gitk --all
```

4. How to throw away uncommitted change in a single file?

```
git checkout -- file
```