CS 580 Client-Server Programming
Fall Semester, 2012
Doc 1 Introduction
Aug 28, 2012

Reading

Mercurial: The Definitive Guide, Bryan O'Sullivan,
http://hgbook.red-bean.com/read/index.html
Chapters 2, 3, 5.

Crashing

Last Day to Drop	Last Day to Add
Feb 2	Feb 4

Crashing Rules

As seats open up will fill them

Priority based on number of SDSU units in CS currently on your transcript

- Will alternate between undergrad and grad students

Give me a copy of unofficial transcript (email is fine)

- Need transcript at least 1 hour before class

People attending class have priority

Open University students have lower priority than SDSU students

Will start adding people Thursday in class

Course Web Site

http://www.eli.sdsu.edu/index.html

CS 580 Spring 12

Lecture Notes
Assignments
Wiki
Course Portal
Syllabus
Reading Assignments

Languages

Java

Client-Server

Client

- Initiates peer-to-peer communication
- Translate user requests into requests for data from server via protocol
- GUI often used to interact with user

Server

- Program that waits for incoming communication requests from a client
- Extracts requested information from data and return to client

What you will do

Implement Android client to talk to existing server using classic sock programming

Implement server for your existing client

Modify Android client to use HTTP to talk to existing server

Modify Android client to use distributed objects

Android

Use Eclipse to develop

- PC, Macs, Linux

Free download

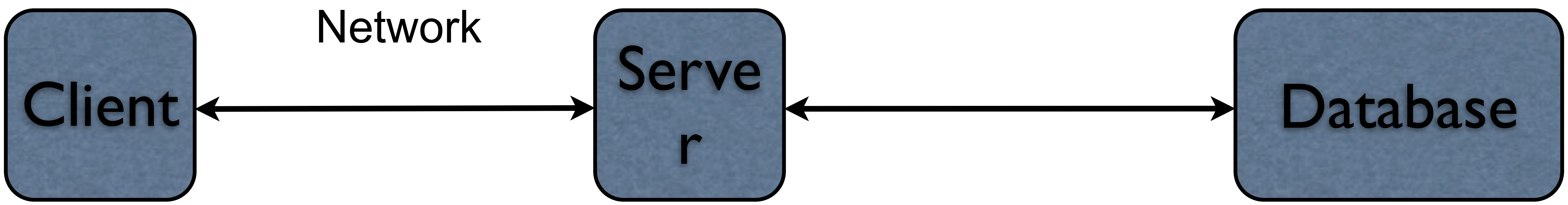
Contains emulator but devices are better

Plan to spend about 3 weeks covering Android

- So will not cover all of Android

What makes Client-Server programming hard

Separate components



What makes Client-Server programming hard

Multitasking

- Both client & server typically use threads to handle multiple task at same time

What makes Client-Server programming hard

Range of task you need to handle

- Network communication
- Threads
- UI design and implementation
- Database
- Protocol design
- Data security
- Authentication
- Authorization

Required of a Programmer

Designing robust protocols

Network programming

Designing usable computer-human interfaces

Good documentation skills

Good debugging skills

Understand the information flow of the company/customer

Mastery of concurrency

Multi-platform development

Database programming

Security

Scale Changes Everything

Sharpen your programming skills

Names

avd brvtns

	Java	Smalltalk	C#	Ruby
Class	PascalCase	PascalCase	PascalCase	PascalCase
Method	camelCase	camelCase	PascalCase	foo_bar
Field	camelCase	camelCase	camelCase	@foo_bar
Parameter	camelCase	camelCase	camelCase	foo_bar
Local Variable	camelCase	camelCase	camelCase	foo_bar

```
x = x + 1 //Add one to x
```

What does this do?

```
for i := 1 to n do
 MeetsCriteria[ i ] := True;
for  i := 1 to n / 2  do begin
 j := i + i;
 while ( j <= n ) do begin
  MeetsCriteria[ j ] := False;
  j := j + i;
 end;
for i := 1 to n do
 if MeetsCriteria[ i ] then
  writeln( i, ' meets criteria ' );
```

What does this do?

```
for PrimeCandidate:= 1 to Num do
      IsPrime[ PrimeCandidate] := True;

for  Factor:= 1 to Num / 2  do begin
      FactorableNumber := Factor + Factor ;
      while ( FactorableNumber <= Num ) do begin
            IsPrime[ FactorableNumber ] := False;
            FactorableNumber := FactorableNumber + Factor ;
      end;
end;

for PrimeCandidate:= 1 to Num do
      if IsPrime[ PrimeCandidate] then
            writeln( PrimeCandidate, ' is Prime ' );
```

Source Control

Track changes in software

Maintain software in one location

Multiple people can make updates

Common Free Source Control Systems

CVS

Concurrent Versions System

Command line interface in Unix

Various interfaces in Window

Subversion

Claims to be a better CVS

Many commands are same as CVS

Git

Created by Linus Torvald

Distributed Version control

Mercurial

Python based

Distributed version control

Mercurial

http://mercurial.selenic.com/

Runs on:

- Mac OS X
- Unix
- Linux
- Windows

Command line interface

GUI interface for windows

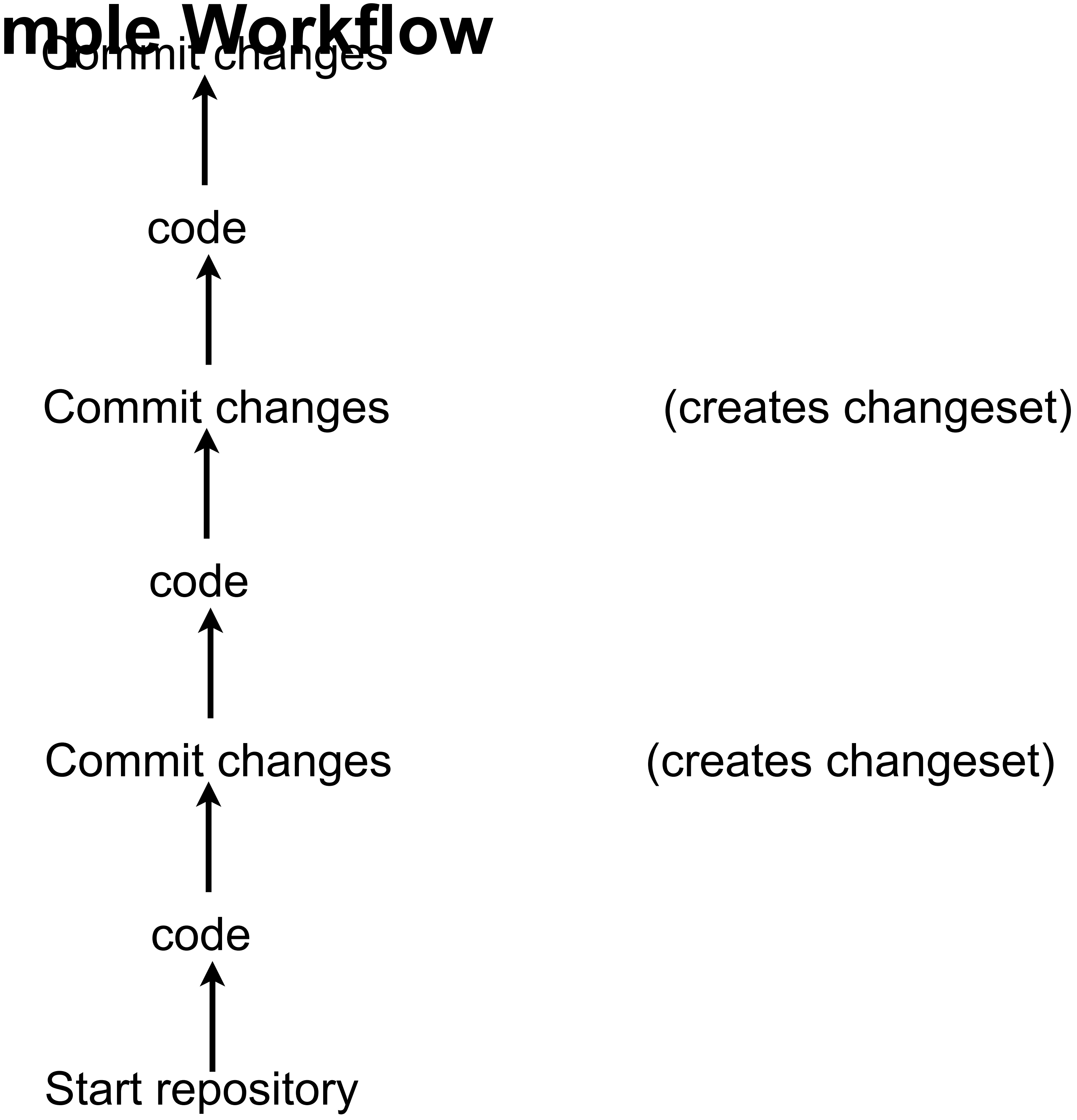
Eclipse plugins

Can use locally with no server

Mercurial in Eclipse

https://bitbucket.org/mercurialeclipse/main/wiki/Installation_and_Configuration#!installation-and-configuration

Simple Workflow



Commit changes

code

Commit changes (creates changeset)

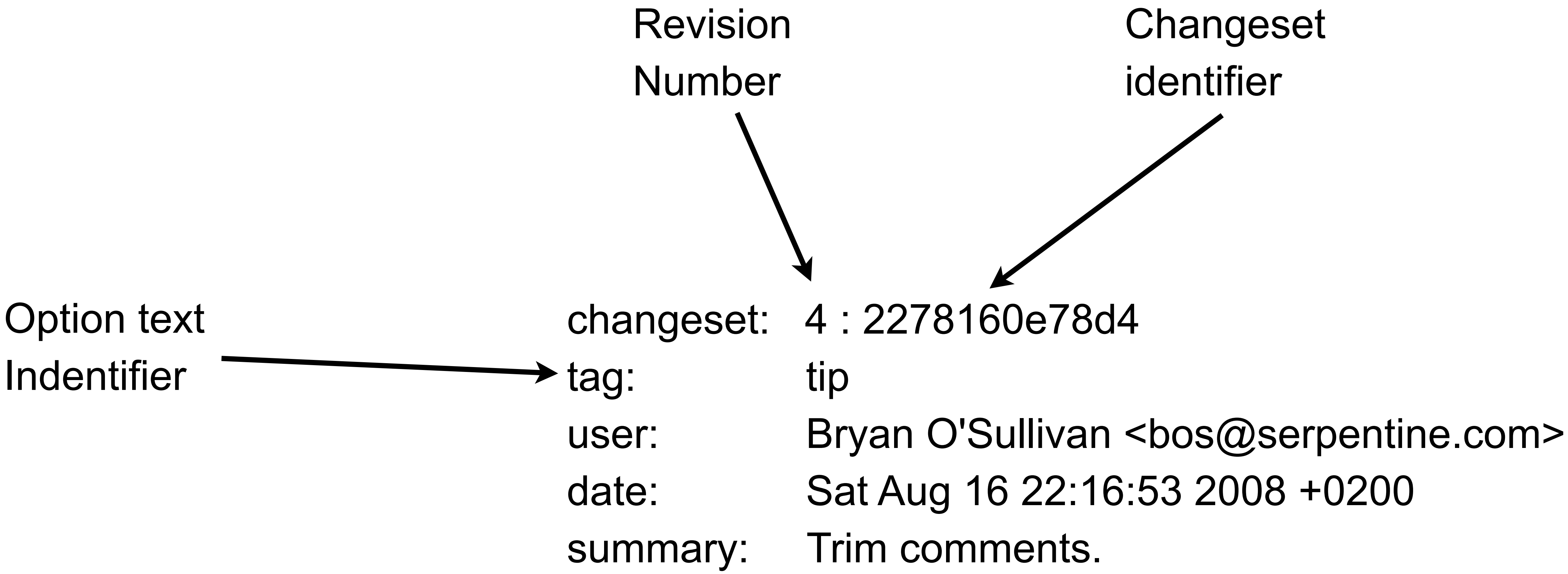
code

Commit changes (creates changeset)

code

Start repository

Changesets



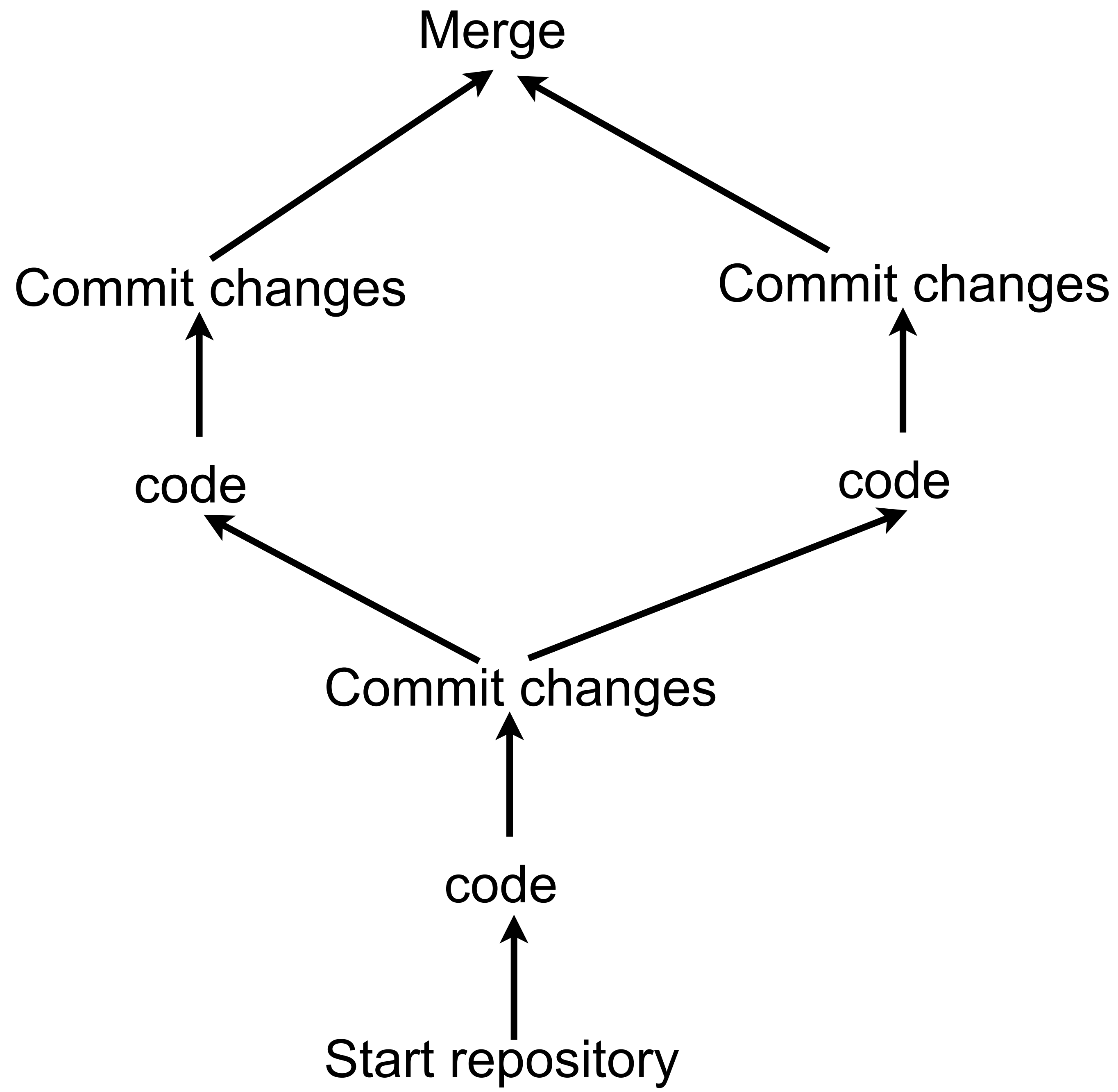
Revision Number

Changeset identifier

Option text Indentifier

```
changeset:   4 : 2278160e78d4
tag:         tip
user:        Bryan O'Sullivan <bos@serpentine.com>
date:        Sat Aug 16 22:16:53 2008 +0200
summary:     Trim comments.
```

Branch in one Repository



Merge

Commit changes

Commit changes

code

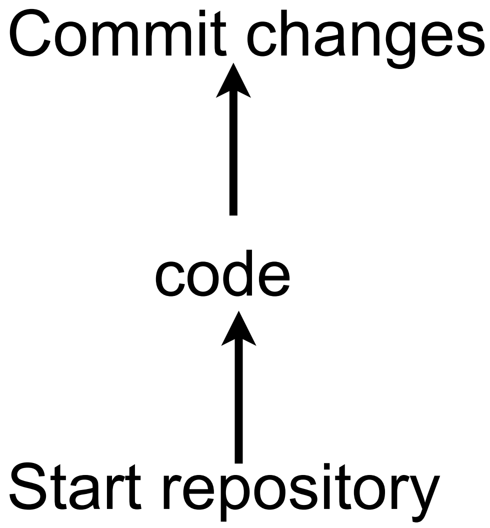
code

Commit changes

code

Start repository

Standard Mercurial Workflow

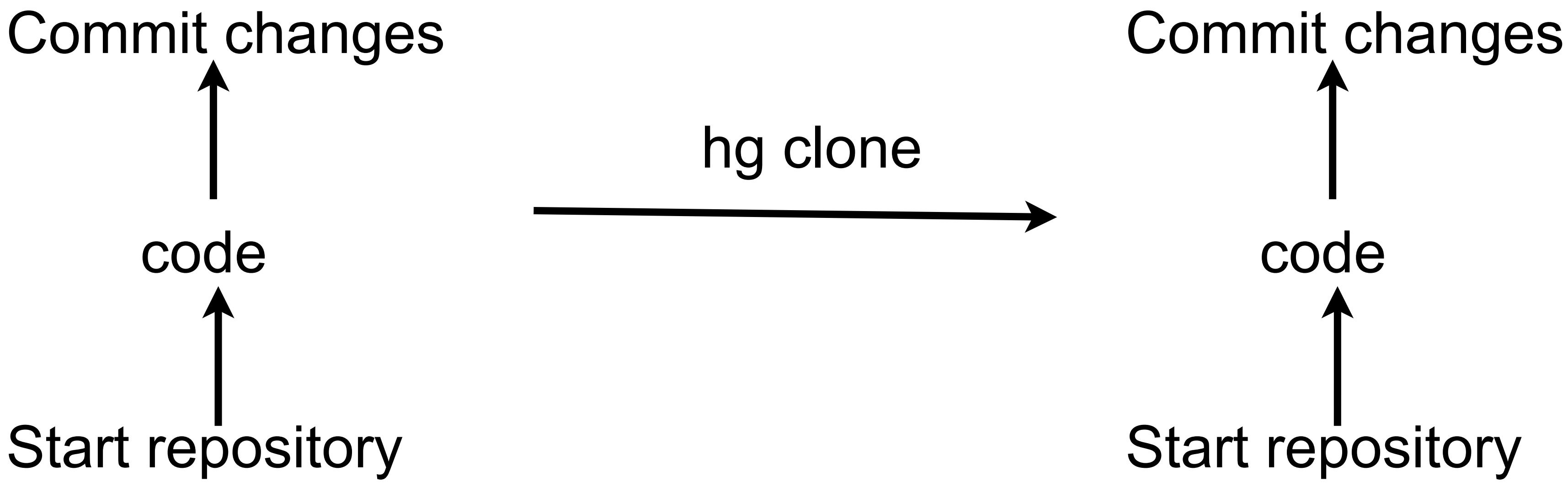


Commit changes

code

Start repository

Standard Mercurial Workflow



Commit changes

code

Start repository

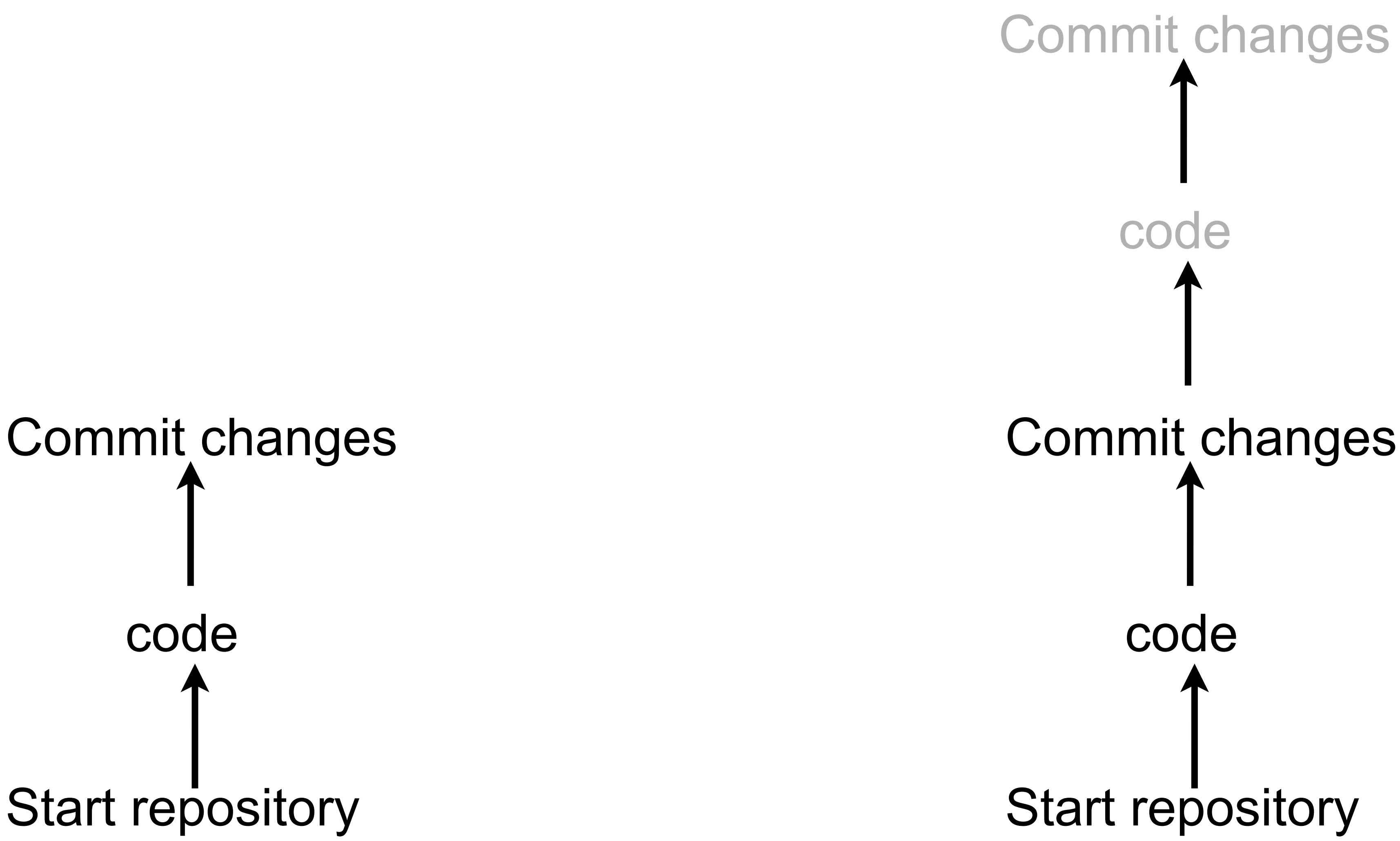
hg clone

Commit changes

code

Start repository

Standard Mercurial Workflow



Commit changes

code

Start repository

Commit changes

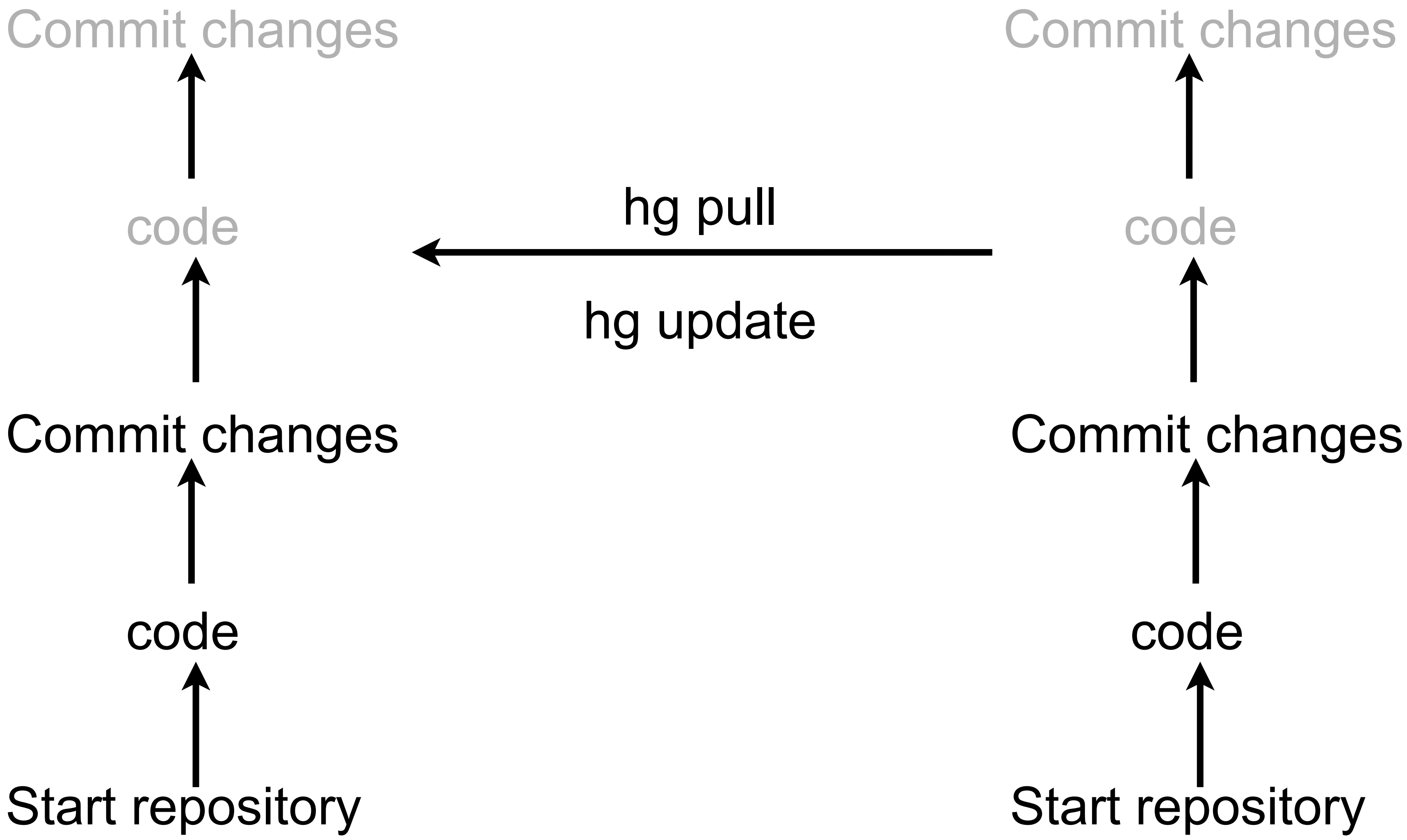
code

Commit changes

code

Start repository

Standard Mercurial Workflow



Commit changes

Commit changes

code

hg pull

code

hg update

Commit changes

Commit changes

code

code

Start repository

Start repository

Basic Source Control Operations

Starting a new project

Adding code to a project

Modifying existing code

Retrieving past versions of code

Handling conflicts in code

Creating code branches

Merging code branches

Cloning repositories

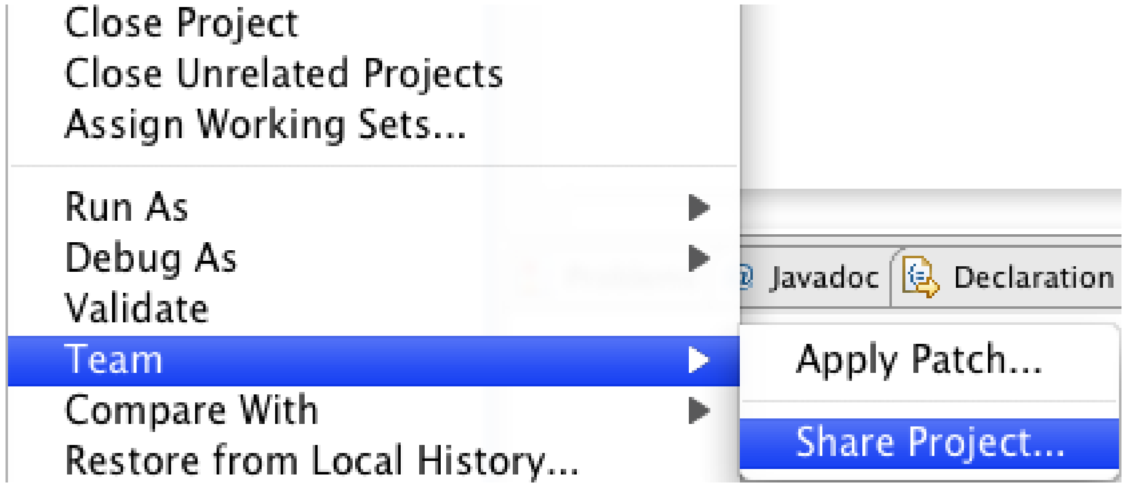
Pulling repositories

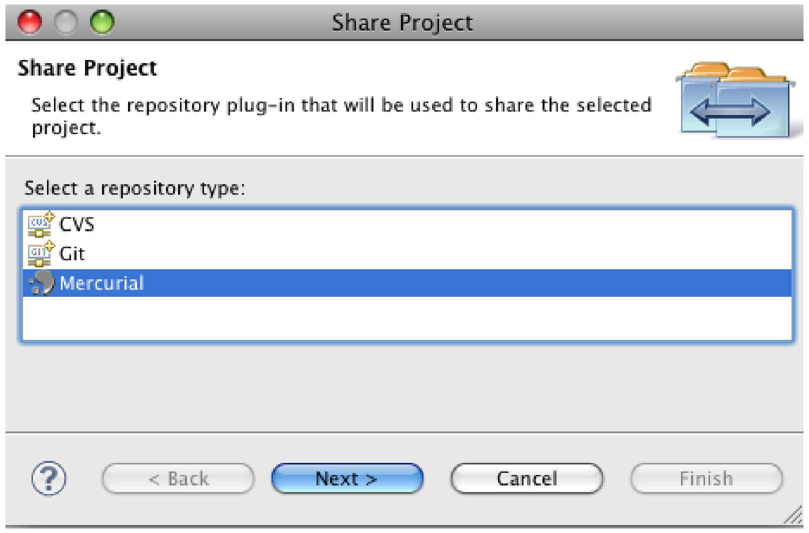
Pushing repositories

Mercurial Commands

Creating a Repository

hg init myproject



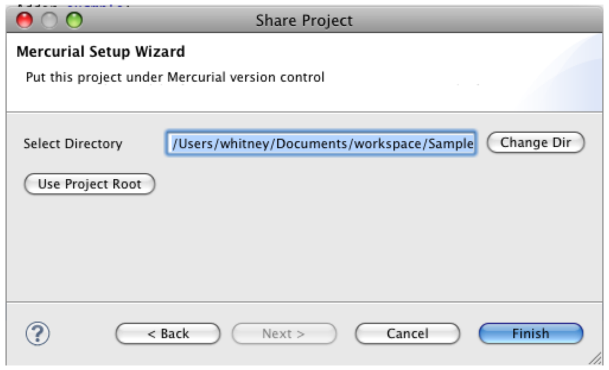

Share Project

Share Project

Select the repository plug-in that will be used to share the selected project.

Select a repository type:

CVS
Git
Mercurial


Share Project

Mercurial Setup Wizard

Put this project under Mercurial version control

Select Directory: /Users/whitney/Documents/workspace/Sample

In Eclipse right click on a project and select the "Share Project..." item in the "Team" menu

Repository & Working Directory

Repository

In .hg directory

Contains
- history of changes
- list of files part of project

Working Directory

Contains
- Project files
- Project directories
- .hg

Adding Files to Repository

Must tell Repository which files to maintain

hg add

Adds all files in the current directory

hg add filename

Adds the named file

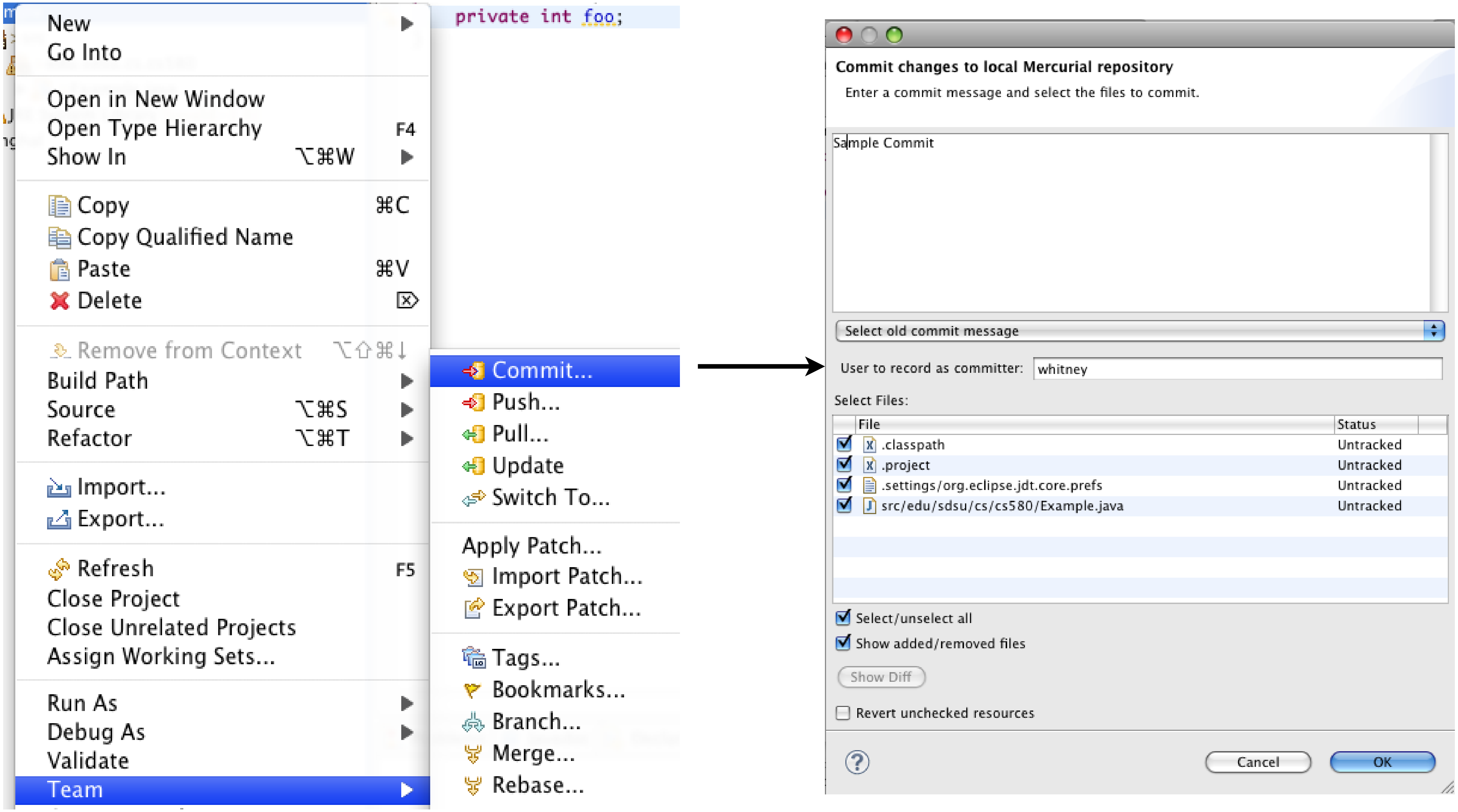
Just adds files to list of files to maintain

Does not add contents of files to repository

Committing files to Repository

```
hg commit
```

Adding/Committing in Eclipse



Commit changes to local Mercurial repository

Enter a commit message and select the files to commit.

Sample Commit

User to record as committer: whitney

Select Files:

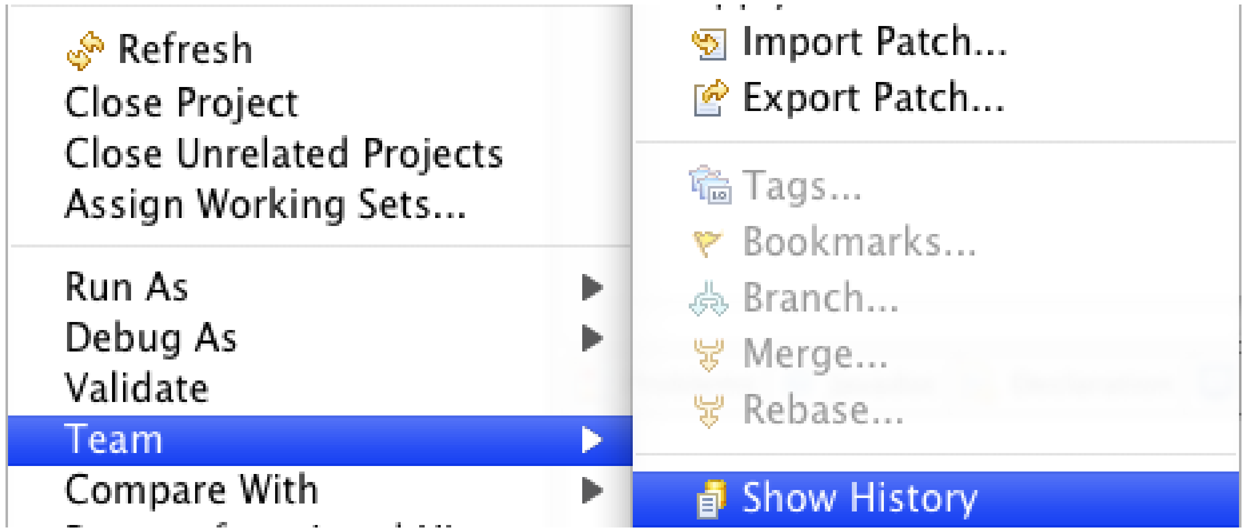
File	Status
☑ .classpath	Untracked
☑ .project	Untracked
☑ .settings/org.eclipse.jdt.core.prefs	Untracked
☑ src/edu/sdsu/cs/cs580/Example.java	Untracked

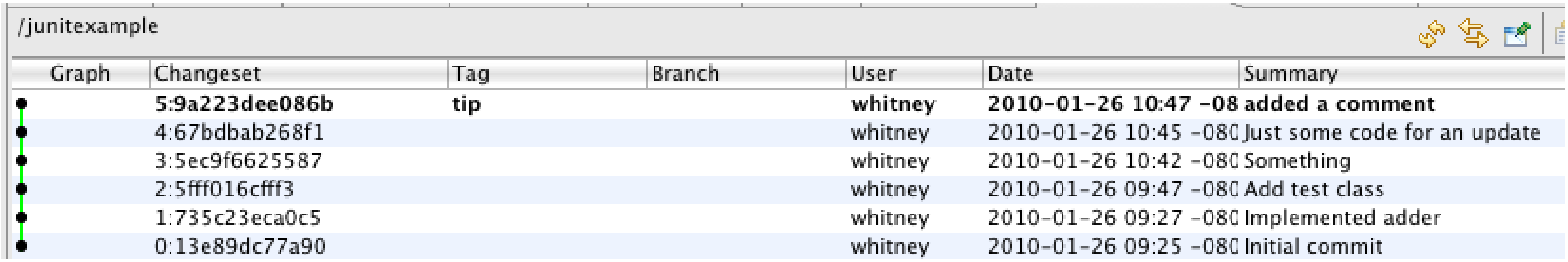
☑ Select/unselect all

☑ Show added/removed files

□ Revert unchecked resources

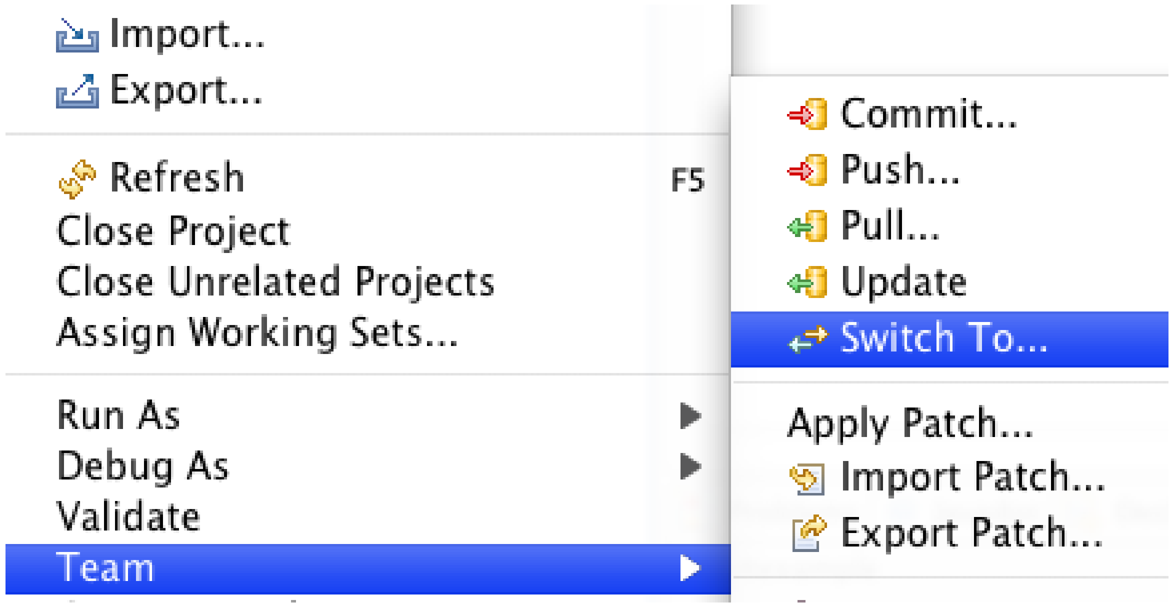
hg log

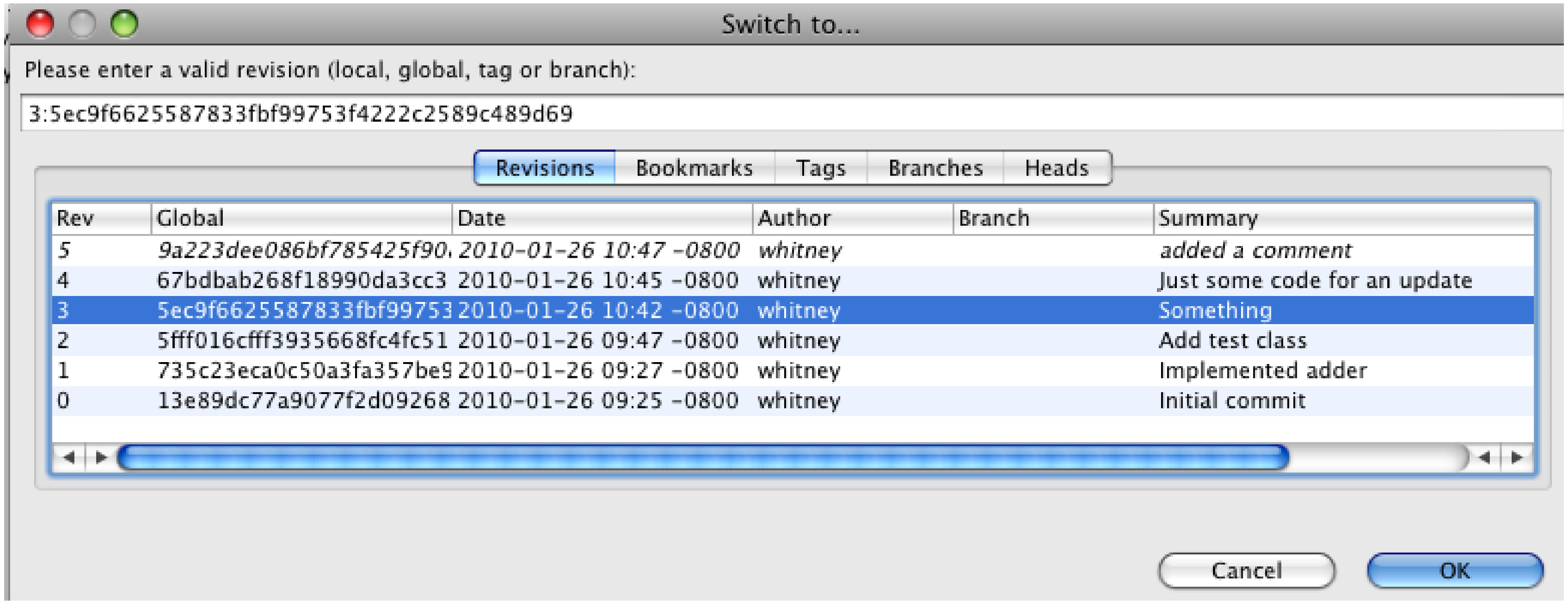




Graph	Changeset	Tag	Branch	User	Date	Summary
●	**5:9a223dee086b**	**tip**		**whitney**	**2010-01-26 10:47 -08**	**added a comment**
●	4:67bdbab268f1			whitney	2010-01-26 10:45 -080	Just some code for an update
●	3:5ec9f6625587			whitney	2010-01-26 10:42 -080	Something
●	2:5fff016cfff3			whitney	2010-01-26 09:47 -080	Add test class
●	1:735c23eca0c5			whitney	2010-01-26 09:27 -080	Implemented adder
●	0:13e89dc77a90			whitney	2010-01-26 09:25 -080	Initial commit

Reverting to different Version



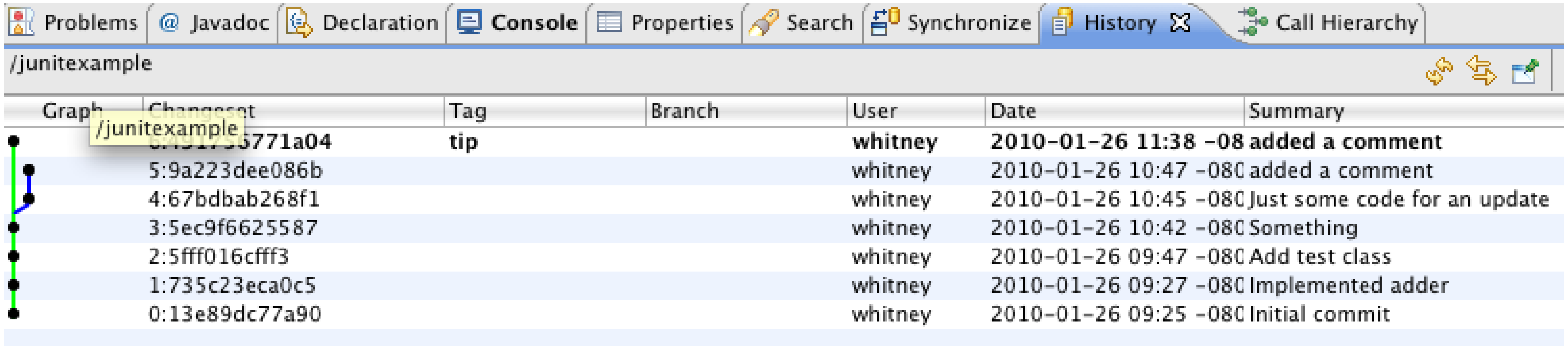


Please enter a valid revision (local, global, tag or branch):

3:5ec9f6625587833fbf99753f4222c2589c489d69

Rev	Global	Date	Author	Branch	Summary
5	9a223dee086bf785425f90	2010-01-26 10:47 -0800	whitney		added a comment
4	67bdbab268f18990da3cc3	2010-01-26 10:45 -0800	whitney		Just some code for an update
3	5ec9f6625587833fbf99753	2010-01-26 10:42 -0800	whitney		Something
2	5fff016cfff3935668fc4fc51	2010-01-26 09:47 -0800	whitney		Add test class
1	735c23eca0c50a3fa357be9	2010-01-26 09:27 -0800	whitney		Implemented adder
0	13e89dc77a9077f2d09268	2010-01-26 09:25 -0800	whitney		Initial commit

Creating Branches

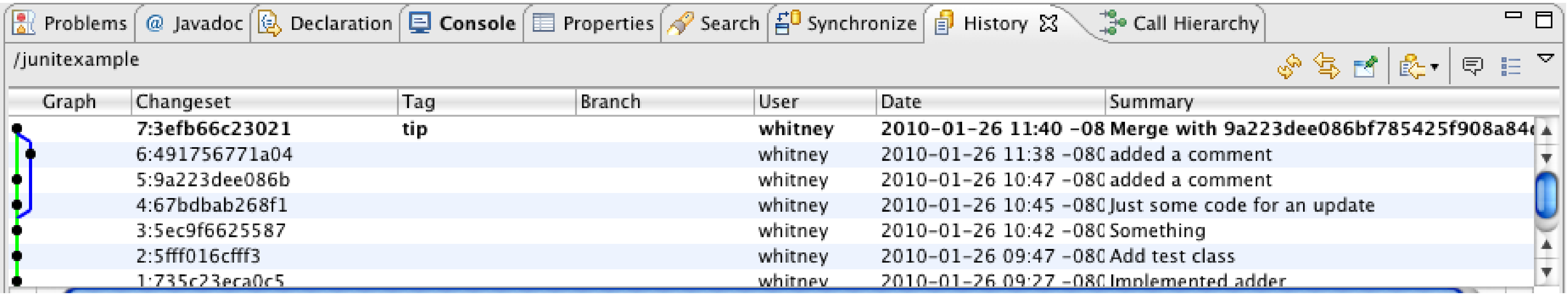


/junitexample

Graph	Changeset	Tag	Branch	User	Date	Summary
●	**6:491756771a04**	**tip**		**whitney**	**2010-01-26 11:38 -08**	**added a comment**
●	5:9a223dee086b			whitney	2010-01-26 10:47 -080	added a comment
●	4:67bdbab268f1			whitney	2010-01-26 10:45 -080	Just some code for an update
●	3:5ec9f6625587			whitney	2010-01-26 10:42 -080	Something
●	2:5fff016cfff3			whitney	2010-01-26 09:47 -080	Add test class
●	1:735c23eca0c5			whitney	2010-01-26 09:27 -080	Implemented adder
●	0:13e89dc77a90			whitney	2010-01-26 09:25 -080	Initial commit

Merging - without conflicts

use the merge item in the team menu
and commit



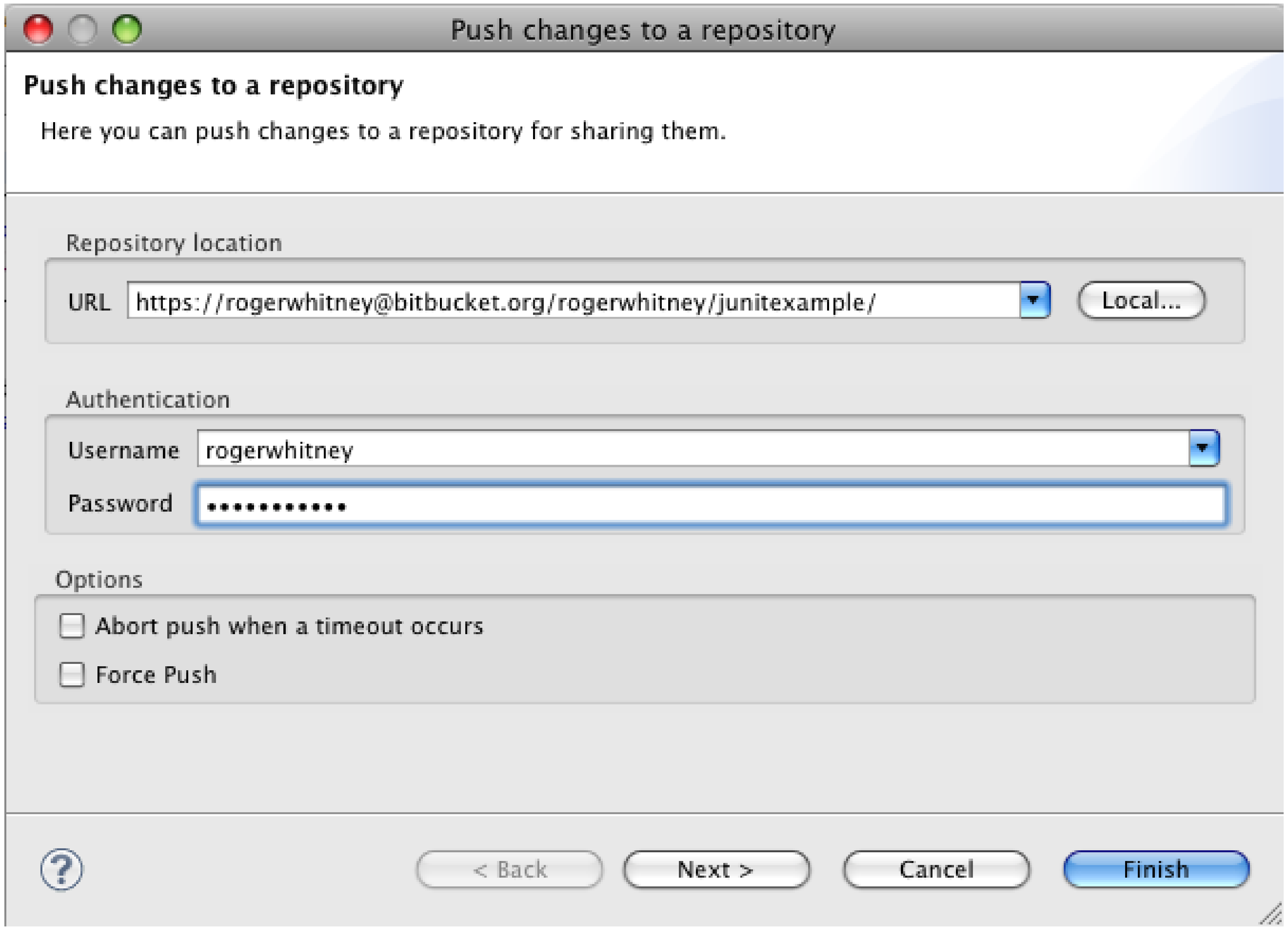
/junitexample

Graph	Changeset	Tag	Branch	User	Date	Summary
	7:3efb66c23021	**tip**		**whitney**	**2010-01-26 11:40 -08**	**Merge with 9a223dee086bf785425f908a84**
	6:491756771a04			whitney	2010-01-26 11:38 -080	added a comment
	5:9a223dee086b			whitney	2010-01-26 10:47 -080	added a comment
	4:67bdbab268f1			whitney	2010-01-26 10:45 -080	Just some code for an update
	3:5ec9f6625587			whitney	2010-01-26 10:42 -080	Something
	2:5fff016cfff3			whitney	2010-01-26 09:47 -080	Add test class
	1:735c23eca0c5			whitney	2010-01-26 09:27 -080	Implemented adder

Uploading to BitBucket

After creating a project in BitBucket

Use the Push item in the team menu



Push changes to a repository

Push changes to a repository

Here you can push changes to a repository for sharing them.

Repository location

URL: https://rogerwhitney@bitbucket.org/rogerwhitney/junitexample/

Authentication

Username: rogerwhitney

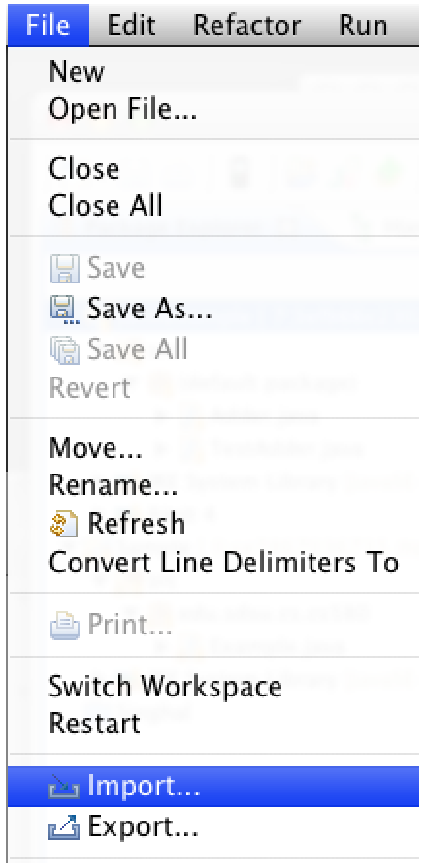
Password: ••••••••••••

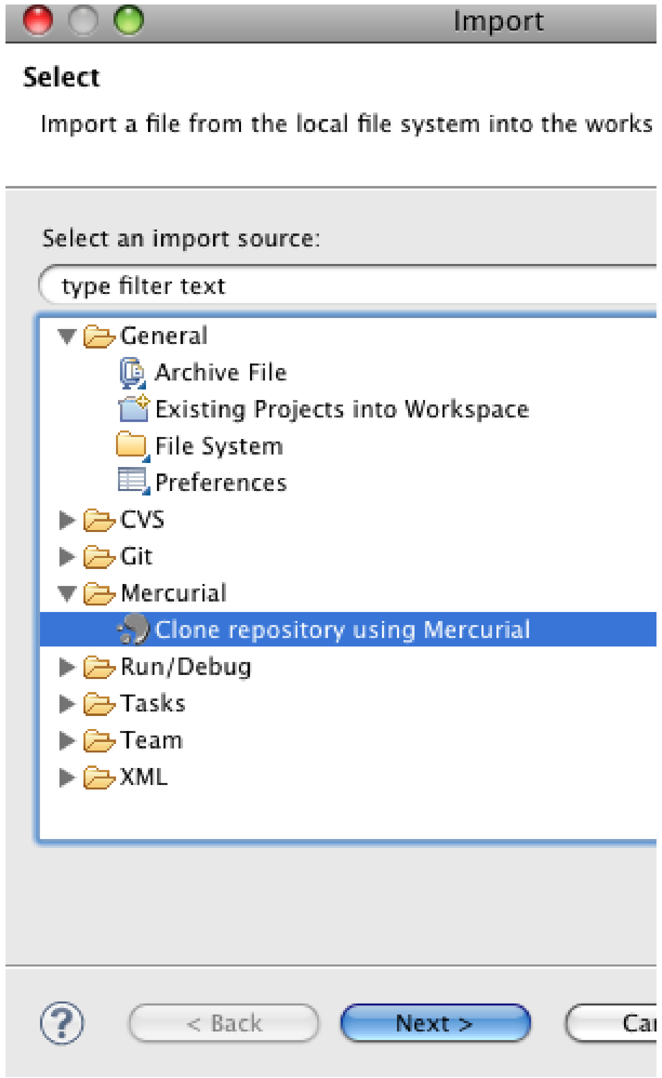
Options

□ Abort push when a timeout occurs

□ Force Push

Downloading From Bitbucket



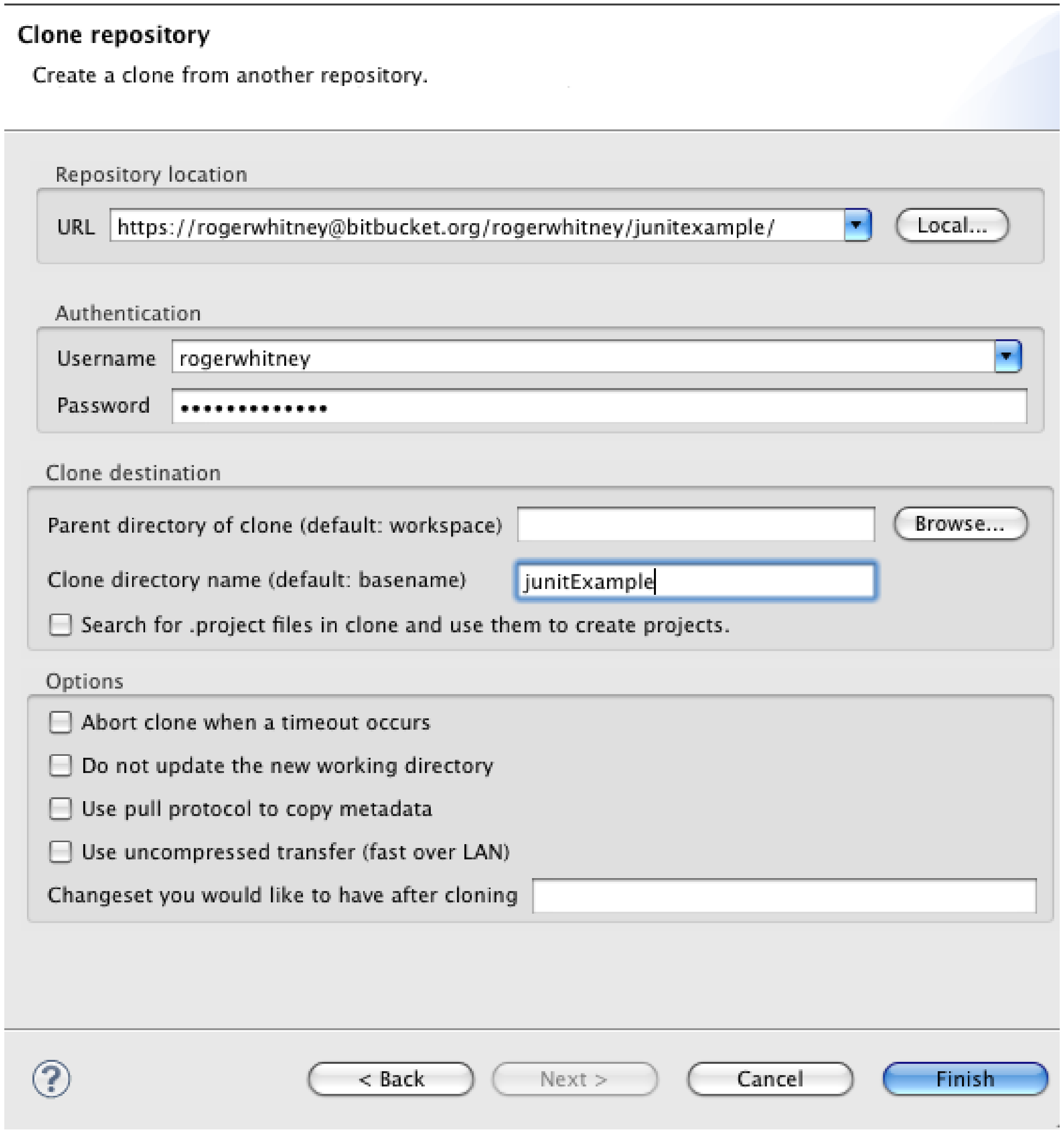


Select

Import a file from the local file system into the works

Select an import source:

type filter text



Clone repository

Create a clone from another repository.

Repository location

URL: https://rogerwhitney@bitbucket.org/rogerwhitney/junitexample/

Authentication

Username: rogerwhitney

Password: •••••••••••••

Clone destination

Parent directory of clone (default: workspace):

Clone directory name (default: basename): junitExample

□ Search for .project files in clone and use them to create projects.

Options

□ Abort clone when a timeout occurs

□ Do not update the new working directory

□ Use pull protocol to copy metadata

□ Use uncompressed transfer (fast over LAN)

Changeset you would like to have after cloning: