

Introduction to Git and Github – A Hands-on Course

Class 2: Basic Git Concepts

November 15, 2016

Charles J. Lord, PE
President, Consultant, Trainer
Blue Ridge Advanced Design and Automation

This Week's Agenda

11/14 Intro to Version Control and Code Collaboration

11/15 Basic Git Concepts

11/16 GitHub Hands-On, Part 1

11/17 GitHub Hands-On, Part 2

11/18 Local Clients and Other Hosts

This Week's Agenda

11/14 Intro to Version Control and Code Collaboration

11/15 **Basic Git Concepts**

11/16 GitHub Hands-On, Part 1

11/17 GitHub Hands-On, Part 2

11/18 Local Clients and Other Hosts

Introducing Git

- Created by Linus Torvalds in 2005
- Initially used for writing much of Linux
- Free software under GNU license
- Command-line
- Ports for essentially all OS

Types of Git Files

- Tracked
 - These are the files that are part of the tree we looked at yesterday
 - Master – the current, latest ‘official’ code
 - Staged – code that has not been deemed ‘official’ yet
 - The process of changing Staged code to Master is called “committing”

Types of Git Files

- Untracked
 - Sometimes we want to store files for reference that are never part of the master
 - Snippets
 - Possible future or abandoned features
 - Bug issues (tied in with bug tracking or PM software)
 - Maintained but not part of version control

Types of Git Files

- Ignored
 - Log files (typically compile / link / debug logs)
 - Binaries
 - Object files
 - Any other derivative files from compile / link / debug or other functions such as lint
 - Git is set up to automatically ignore these file types (and this can be modified) *.o *.elf etc

A Distributed VCS

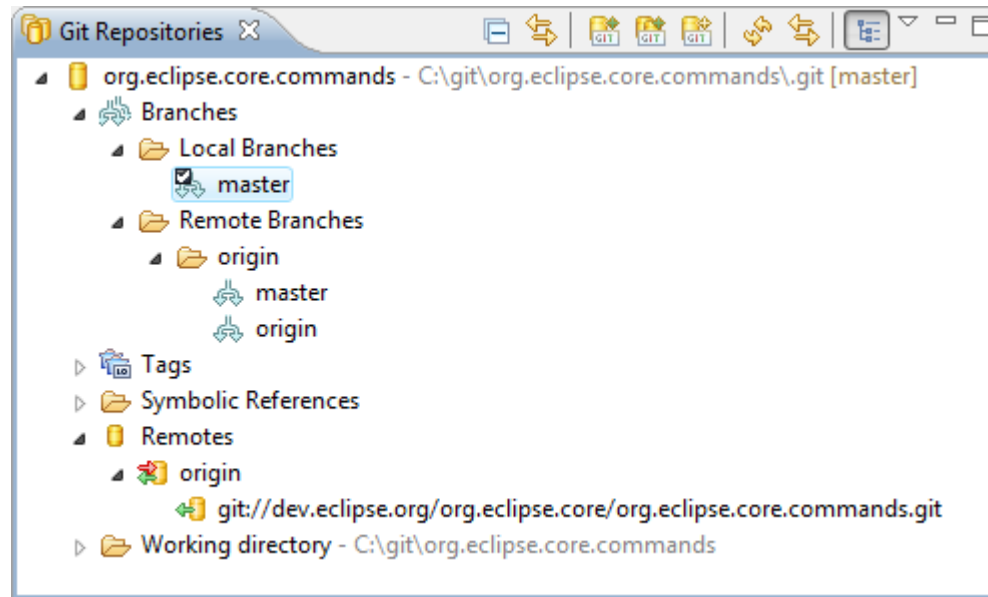
- One powerful concept of git is that it can be local, remote, or both
- You can have git running on your local computer (handy if you are using a portable computer or are remote from your local network)
- You can also use a remote repository, which can be centralized (like GitHub) or another's 'local' repository

Local Git

- Git was written in (of course!) linux
- Ports to windows originally used cygwin
- Python and java versions
- <https://git-scm.com/download/win>
- <https://git-for-windows.github.io/>

Egit – Git Plug-in For Eclipse

<http://www.eclipse.org/egit/>



Getting Your Code

- You can copy an entire repository by using the “clone” command. This is handy for pulling in copies of the entire project from a remote repository
- To work on a branch (revision), we use the “checkout” command. This can either get a copy of the Master, or we can create and name a new branch (to develop a possible new feature, etc)

Handy Cheat Sheet

- There are a number of handy one-page guides or cheat sheets to help us when we are learning the command line.
- The following is from
http://rogerdudler.github.io/git-guide/files/git_cheat_sheet.pdf

Cheat Sheet 1

create & clone

create new repository *git init*

clone local repository *git clone /path/to/repository*

clone remote repository *git clone username@host:/path/to/repository*

add & remove

add changes to INDEX *git add <filename>*

add all changes to INDEX *git add **

remove/delete *git rm <filename>*

Cheat Sheet 2

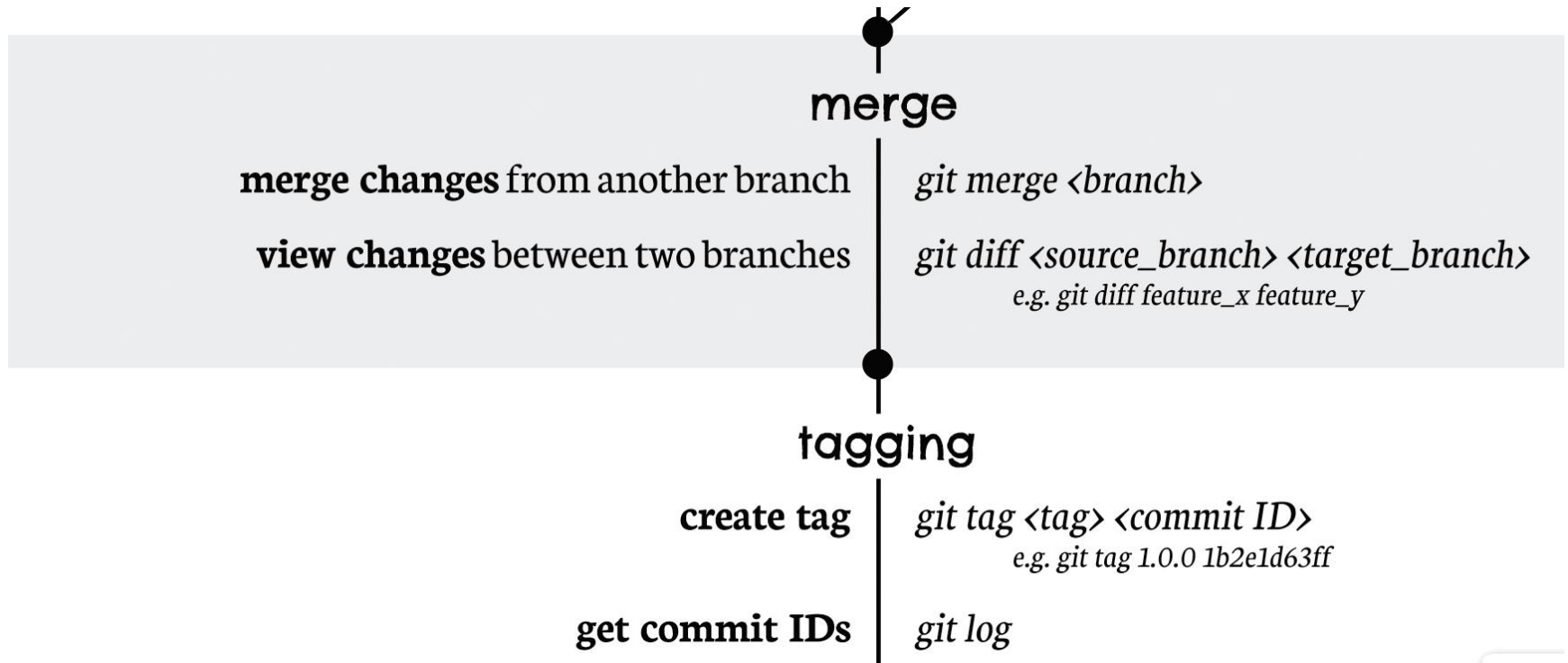
commit & synchronize

commit changes	<i>git commit -m "Commit message"</i>
push changes to remote repository	<i>git push origin master</i>
connect local repository to remote repository	<i>git remote add origin <server></i>
update local repository with remote changes	<i>git pull</i>

branches

create new branch	<i>git checkout -b <branch></i> e.g. <i>git checkout -b feature_x</i>
switch to master branch	<i>git checkout master</i>
delete branch	<i>git branch -d <branch></i>
push branch to remote repository	<i>git push origin <branch></i>

Cheat Sheet 3



GUI To The Rescue

- There are a number of GUI-based tools for git for Windows
- One of the most popular is SourceTree
- <https://www.sourcetreeapp.com/>
- Supports both git and Mercurial (Hg) repositories
- Works seamlessly with Bitbucket, which we will look at Friday

SourceTree

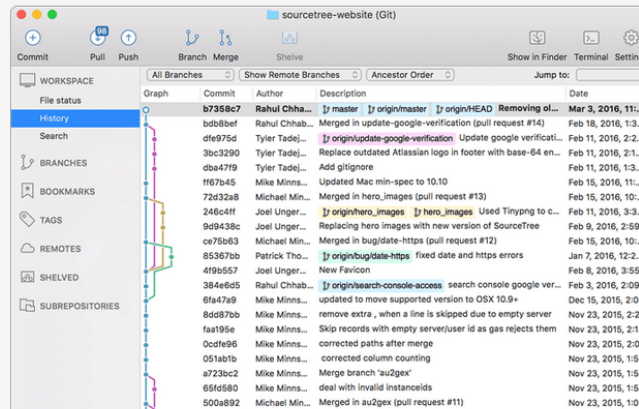


[Download free](#)

Harness the power of Git and Hg in a beautifully simple application

[Download for Windows](#)

Also available for Mac OS X



Join the SourceTree Beta Program

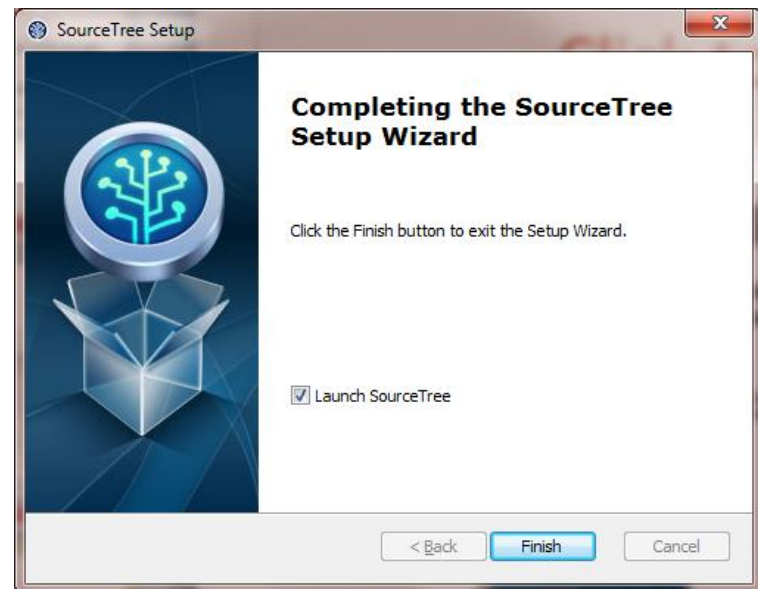
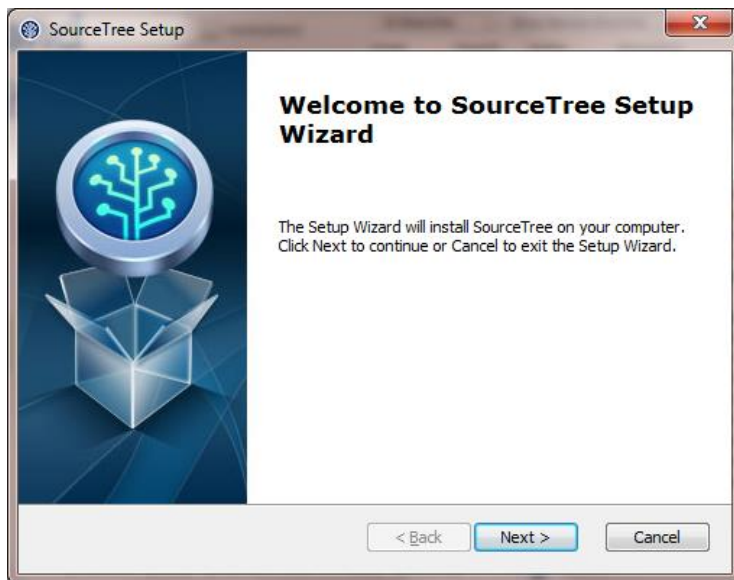
Want access to new features and improvements before they are in production? Sign up for the Beta program to try new features, provide feedback and engage with the SourceTree Team.

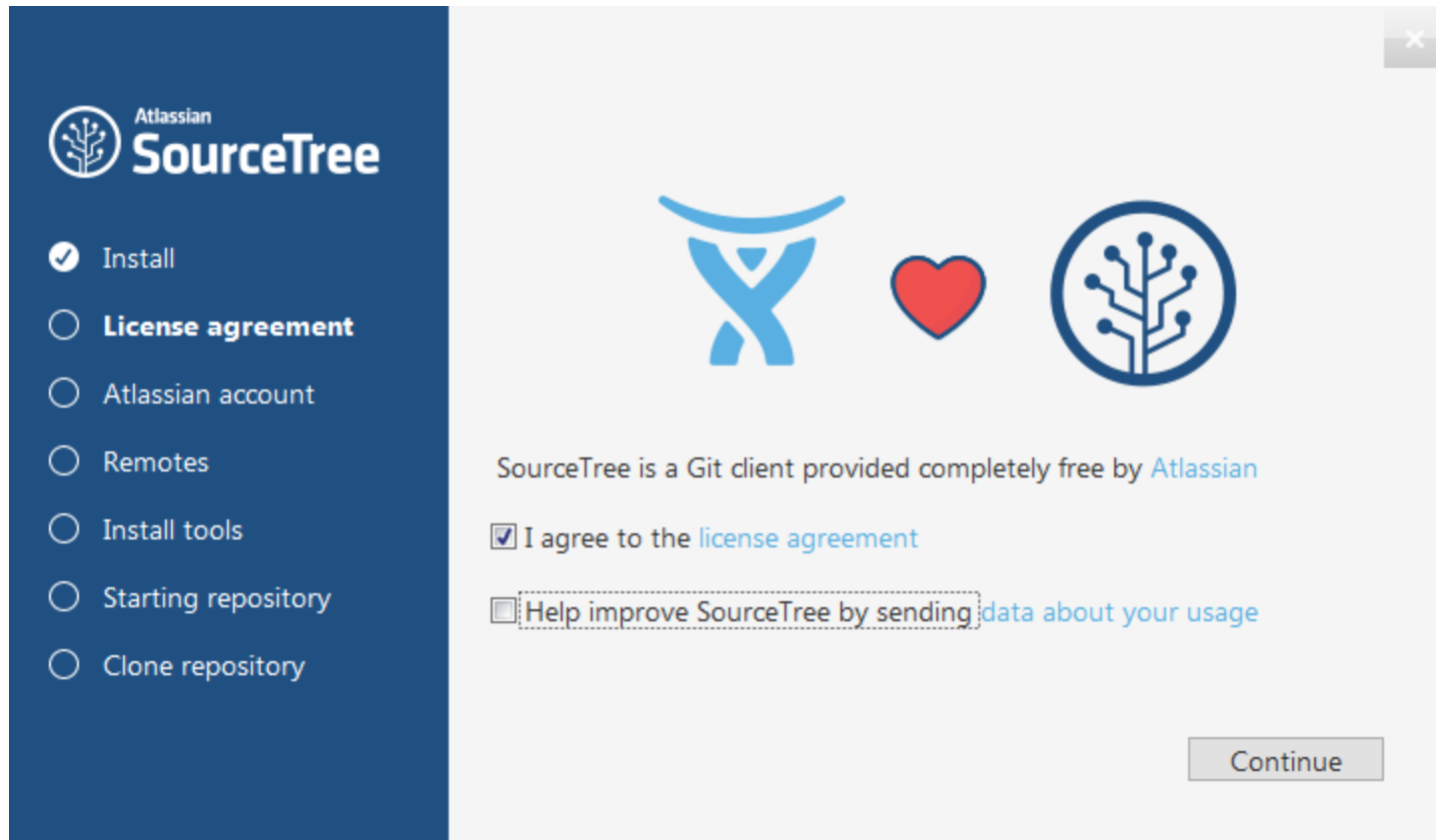
[Sign up now](#)

A free visual Git and Hg client for Mac and Windows

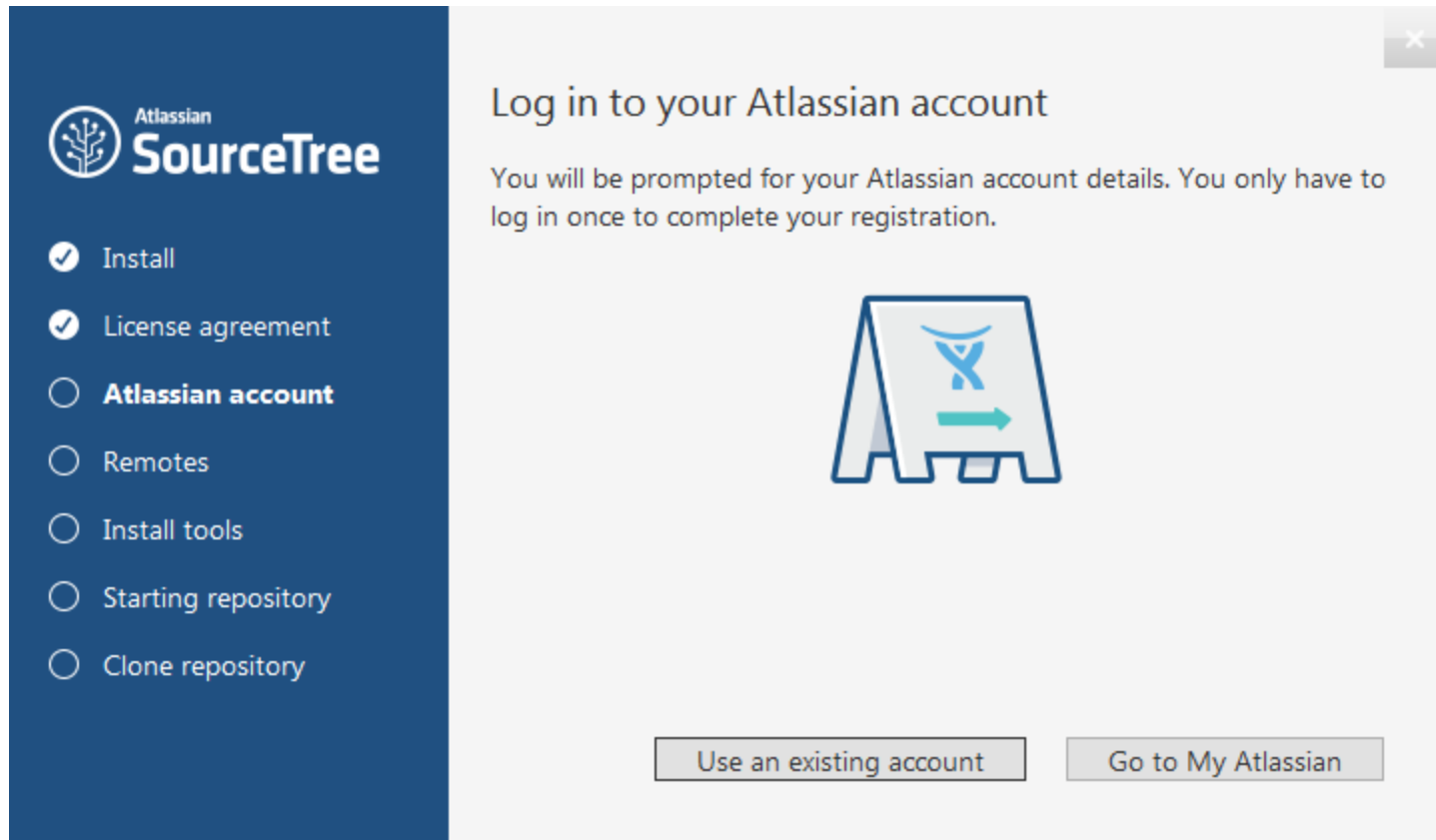
SourceTree simplifies how you interact with your Git and Mercurial repositories so you can focus on coding. Visualize and manage your repositories through SourceTree's simple interface.

Install – use defaults

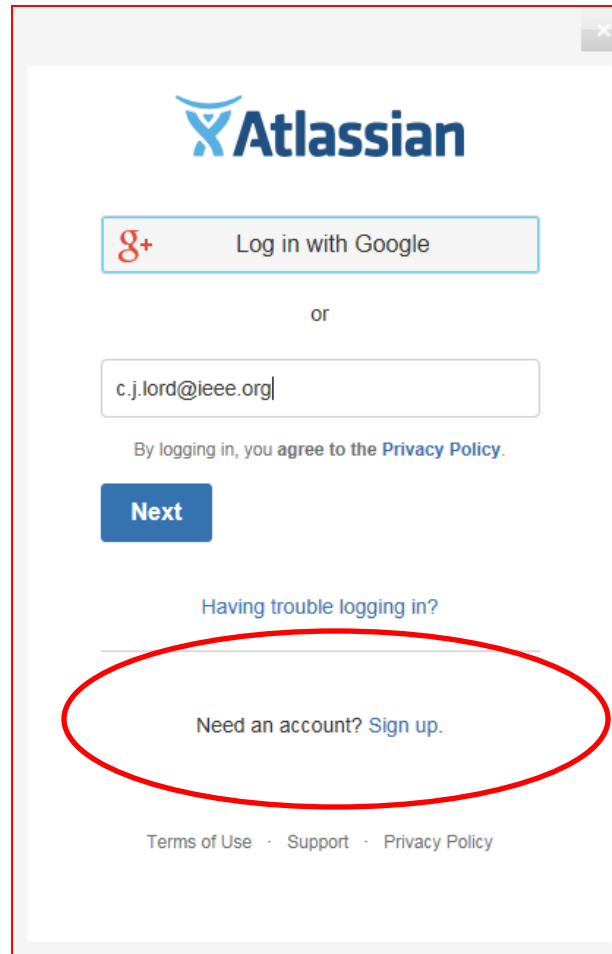




Set Up Account



Sign up or Sign in



The image shows a web browser window displaying the Atlassian login and sign-up page. The Atlassian logo is at the top. Below it is a 'Log in with Google' button. Underneath is the word 'or'. A text input field contains the email 'c.j.lord@ieee.org'. Below the input field is the text 'By logging in, you agree to the Privacy Policy.' and a blue 'Next' button. Further down is the link 'Having trouble logging in?'. At the bottom, the text 'Need an account? Sign up.' is circled in red. At the very bottom are links for 'Terms of Use', 'Support', and 'Privacy Policy'.

Atlassian

g+ Log in with Google

or

c.j.lord@ieee.org

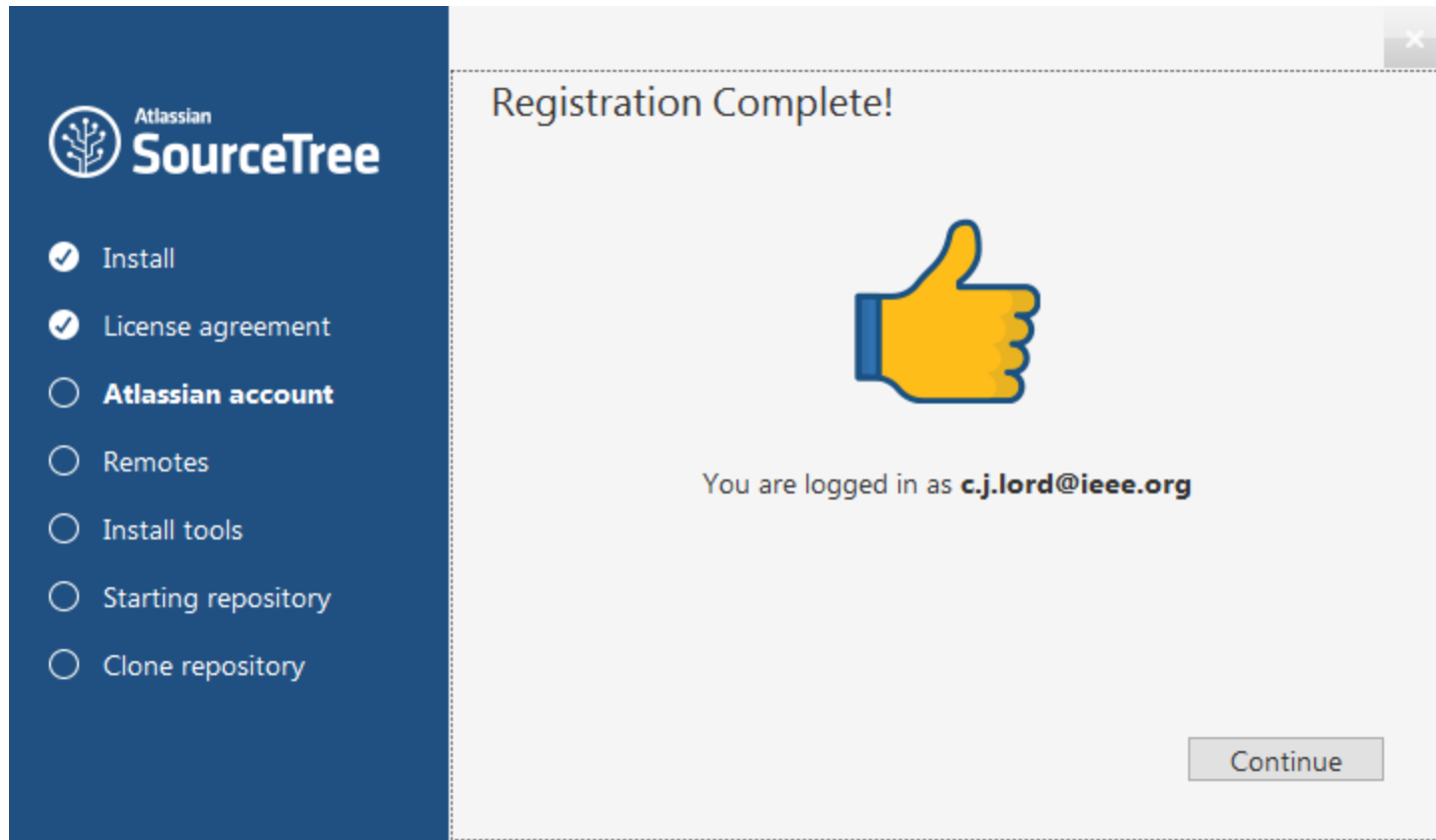
By logging in, you agree to the [Privacy Policy](#).

Next

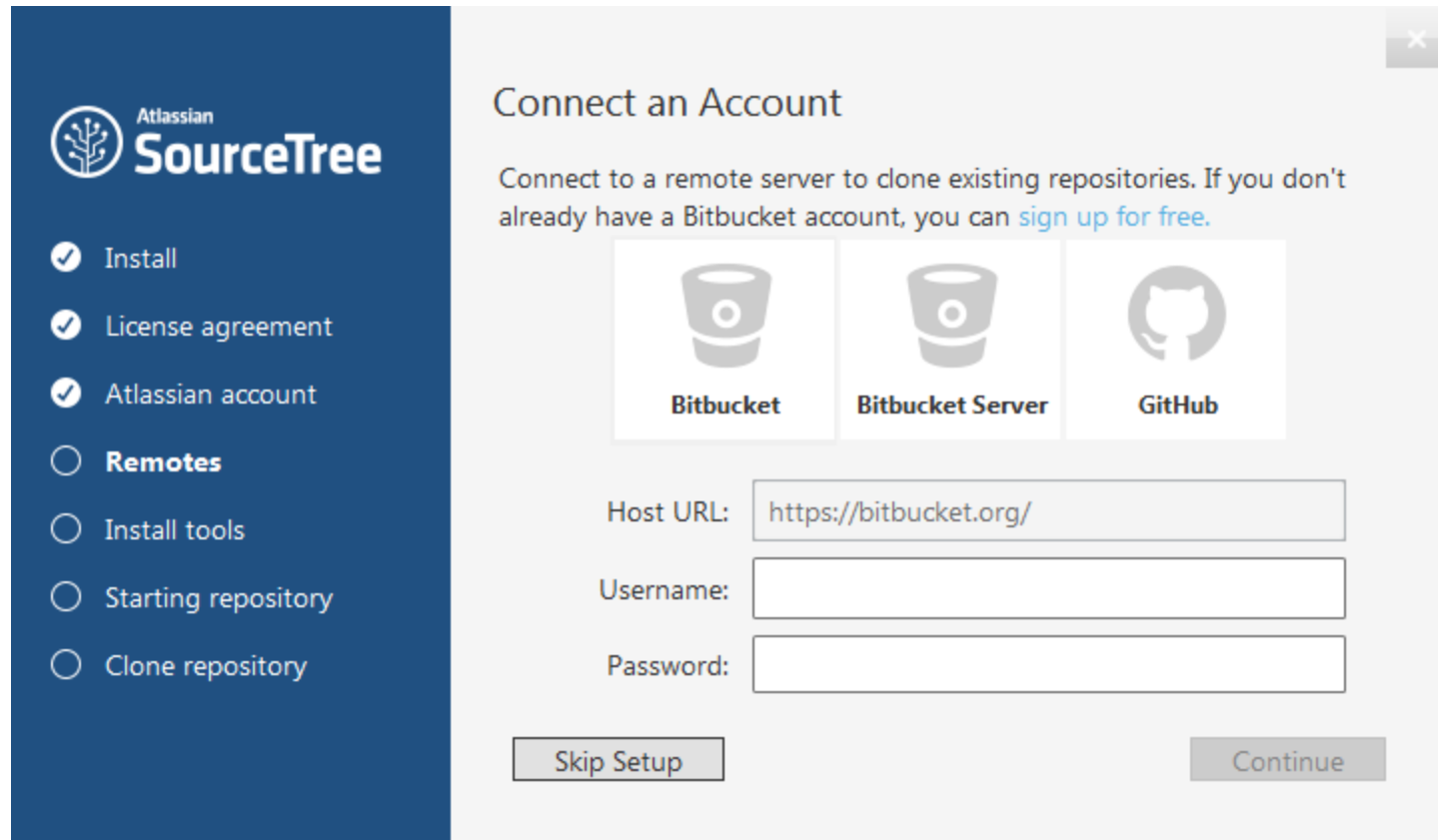
[Having trouble logging in?](#)

Need an account? [Sign up.](#)

[Terms of Use](#) · [Support](#) · [Privacy Policy](#)



If You Have an Account




The image shows the SourceTree installation window. On the left is a dark blue sidebar with the Atlassian SourceTree logo and a list of steps: 'Install' (checked), 'License agreement' (checked), 'Atlassian account' (checked), 'Remotes' (selected with a radio button), 'Install tools' (radio button), 'Starting repository' (radio button), and 'Clone repository' (radio button). The main area is titled 'Connect an Account' and contains instructions to connect to a remote server. Below the text are three icons for Bitbucket, Bitbucket Server, and GitHub. Under these icons are input fields for 'Host URL' (pre-filled with 'https://bitbucket.org/'), 'Username', and 'Password'. At the bottom are 'Skip Setup' and 'Continue' buttons.


Atlassian SourceTree


- ✓ Install
- ✓ License agreement
- ✓ Atlassian account
- ☒ **Remotes**
- ☐ Install tools
- ☐ Starting repository
- ☐ Clone repository

Connect an Account

Connect to a remote server to clone existing repositories. If you don't already have a Bitbucket account, you can [sign up for free](#).

**Bitbucket**

**Bitbucket Server**

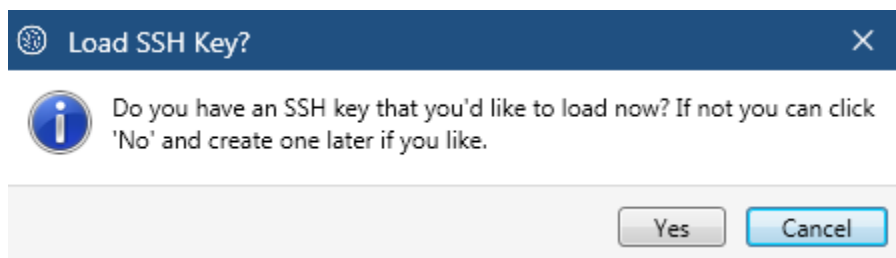
**GitHub**

Host URL:

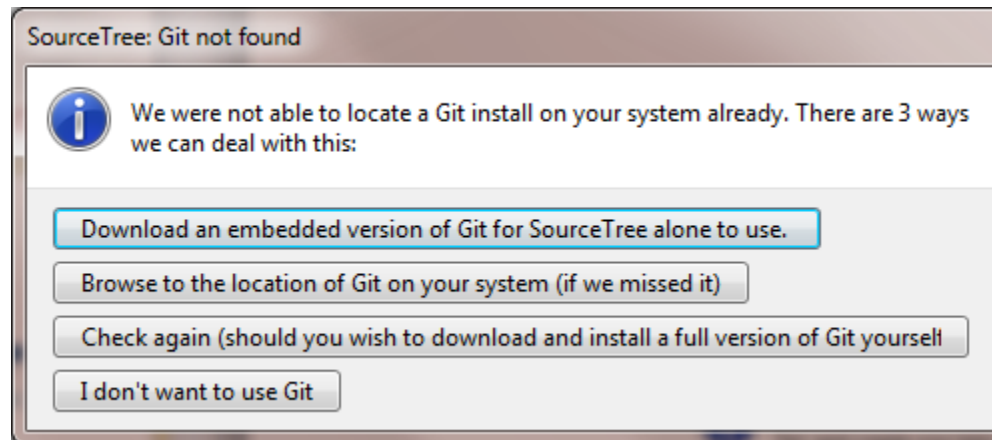
Username:

Password:

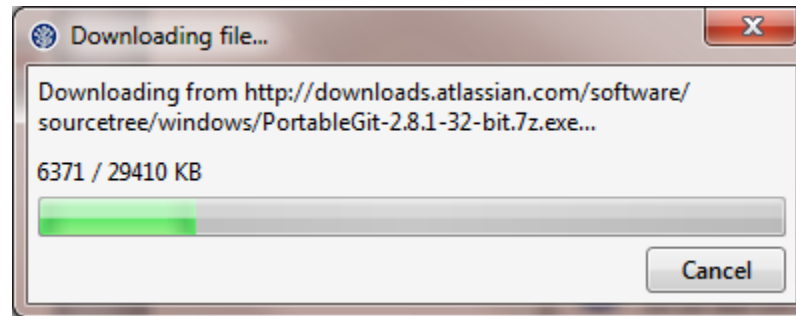
Find the “No” Button



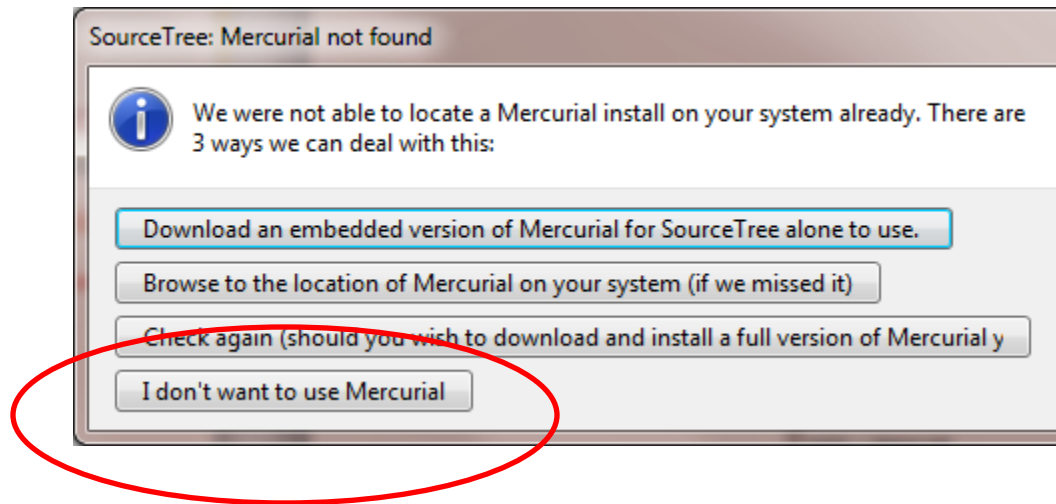
NOW download Git



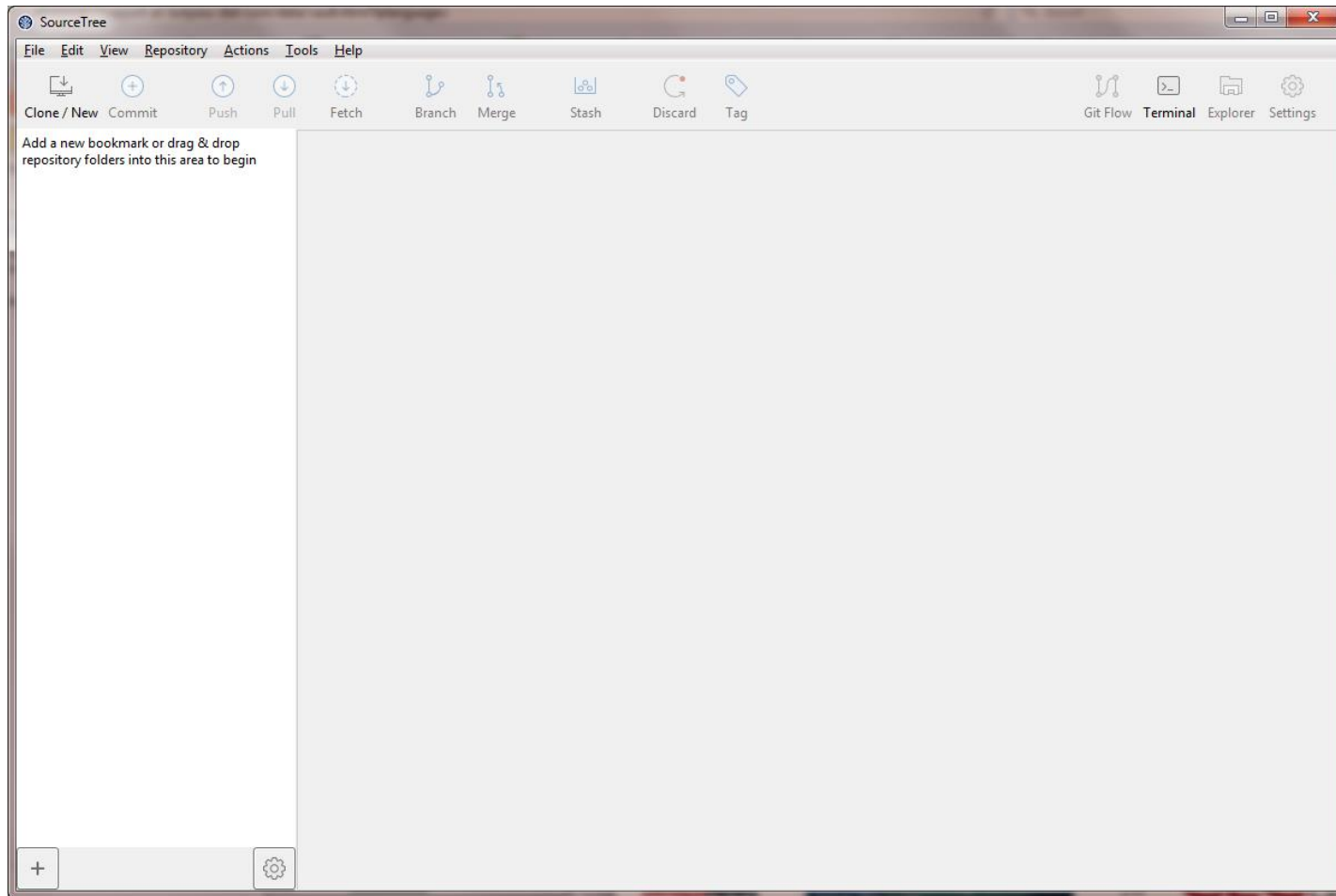
Sourcetree Will Download Git For You



Let's Ignore Hg for Now

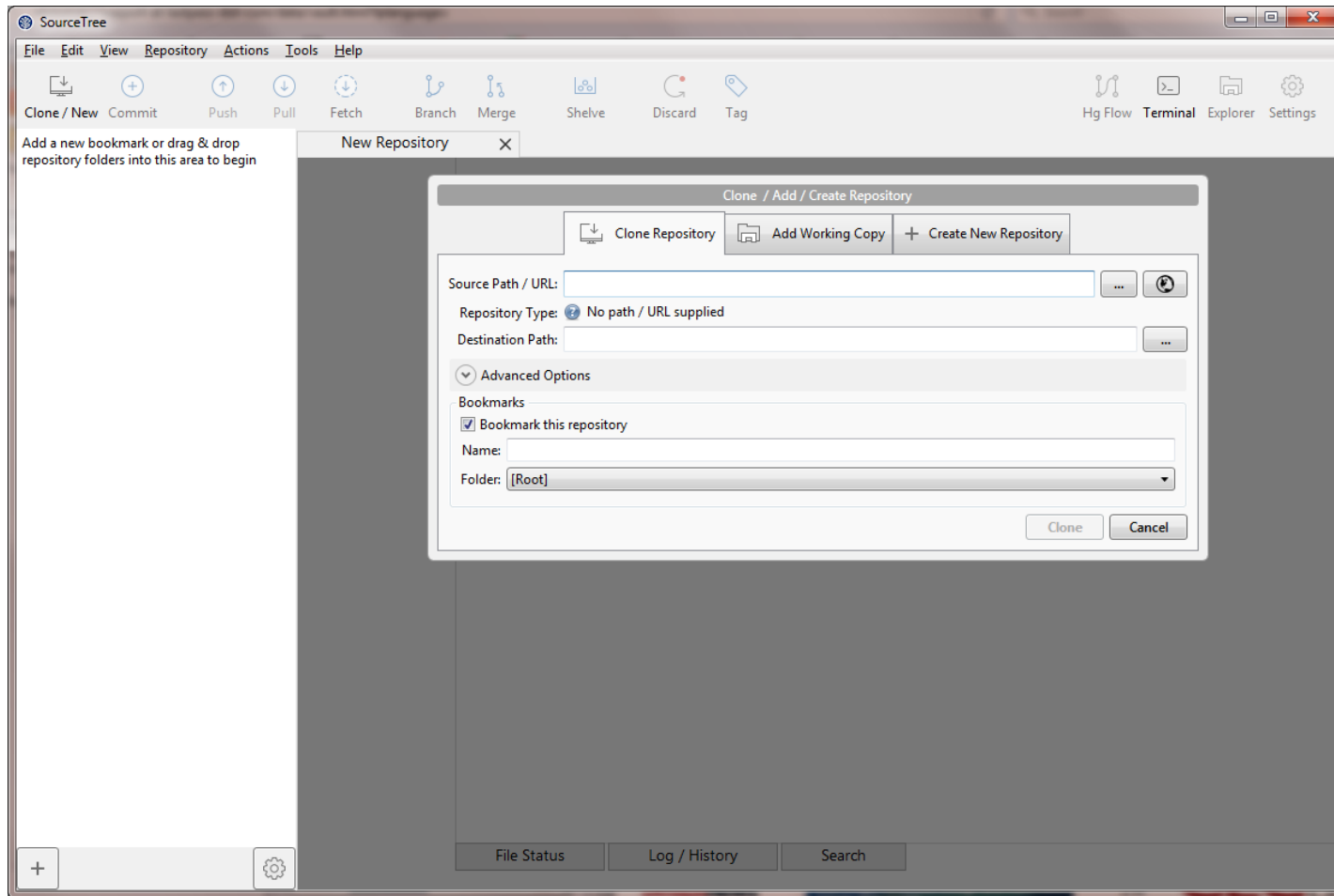


Click on New/Clone



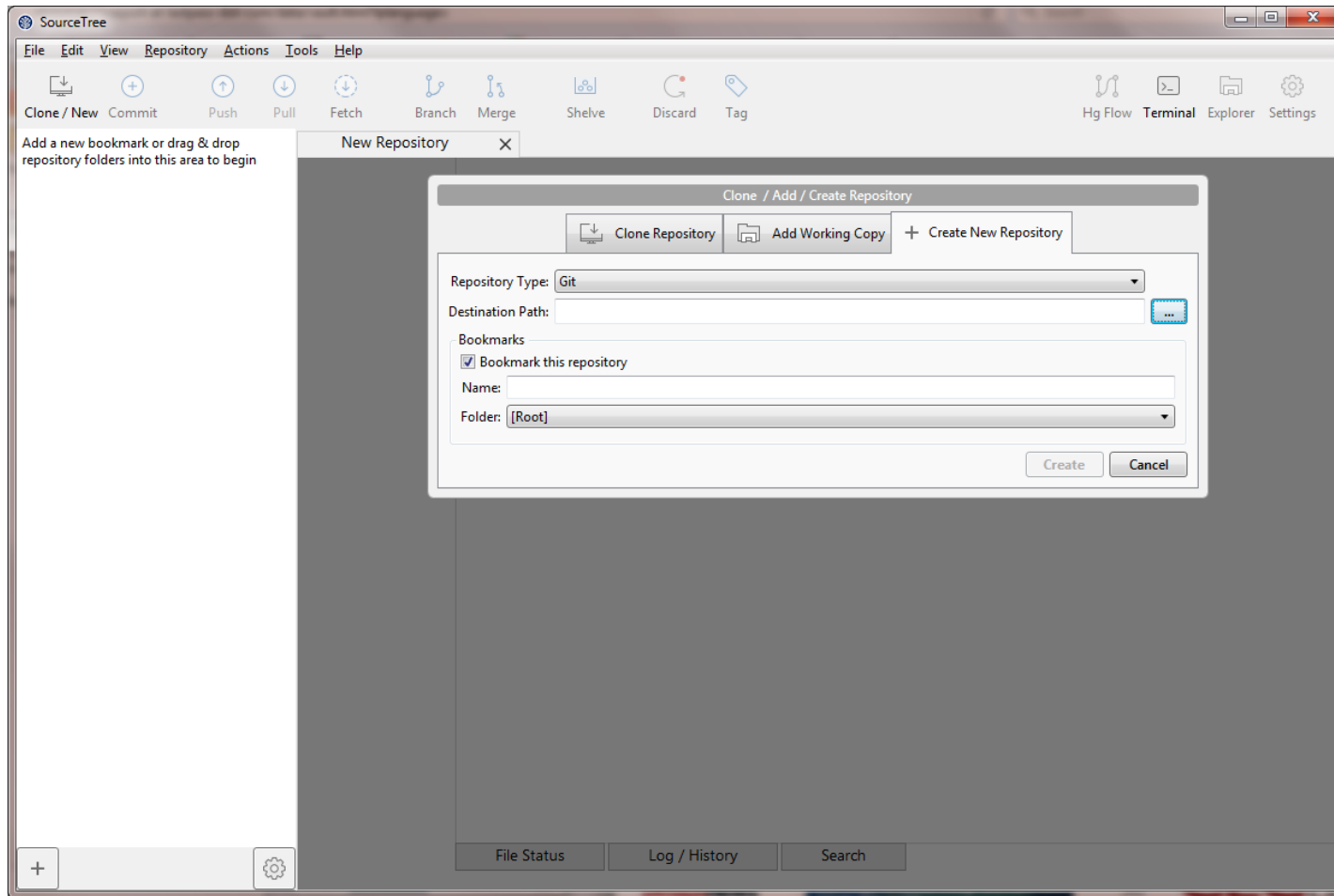
Presented by:

Now We Are Ready



Presented by:

New



Presented by:

What About Remote?

- There are many good repositories for shared projects
- Next we will look at the very popular GitHub
- Friday we will look at the companion Bitbucket

This Week's Agenda

11/14 Intro to Version Control and Code Collaboration

11/15 Basic Git Concepts

11/16 GitHub Hands-On, Part 1

11/17 GitHub Hands-On, Part 2

11/18 Local Clients and Other Hosts

Please stick around as I answer your questions!

- Please give me a moment to scroll back through the chat window to find your questions
- I will stay on chat as long as it takes to answer!
- I am available to answer simple questions or to consult (or offer in-house training for your company)

c.j.lord@ieee.org

<http://www.blueridgetechnc.com>

<http://www.linkedin.com/in/charleslord>

Twitter: @charleslord