

# Using Git

**Git** is a fast decentralized version control system. Git is available for Windows, Linux, and macOS.

You can use the **Gerrit** code review tool for projects that use Git.

## Setting Up Version Control Systems

Qt Design Studio uses the version control system's command line clients to access your repositories. To allow access, make sure that the command line clients can be located using the **PATH** environment variable. Alternatively, specify the path to the command line client executable in the **Command** field in the version control system specific tab in **Edit > Preferences > Version Control**.

If authentication is required to access the repository, enter the user credentials in the **Username** and **Password** fields.

Enter a timeout for version control operations in the **Timeout** field.

For some version control systems, you can specify the maximum number of lines the log can contain in the **Log count** field.

After you set up the version control system, use the command line to check that everything works (for example, use the status command). If no issues arise, you should be ready to use the system also from Qt Design Studio.

For more information on using Git for Windows, see [Using Git for Windows](#).

## Setting Up General Options

Select **Edit > Preferences > Version Control > General** to specify settings for submit messages:

- > **Wrap submit messages at** limits the line length of a submit message to the specified number of characters.
- > **Submit message check script** is a script or program that can be used to perform checks on the submit message before submitting. The submit message is passed in as the script's first parameter. If there is an error, the script should output a message on standard error and return a non-zero exit code.
- > **User/alias configuration file** is a text file that lists author names in mailmap format. For each author, you must specify a real name and email address and optionally an alias and a second email address. For example:

```
Jon Doe <Jon.Doe@company.com> jdoe <jdoe@somemail.com>  
Hans Mustermann <Hans.Mustermann@company.com> hm <info@company.com>
```

- › **User fields configuration file** is a simple text file consisting of lines specifying submit message fields that take authors as values, for example:

```
Acked-by:
Initial-patch-by:
Reported-by:
Rubber-stamped-by:
Signed-off-by:
Tested-by:
```

After you specify a file in this field, you can add authors as values of the submit message fields when submitting changes. If you also specified a **User/alias configuration file**, you can select authors in the **Nicknames** dialog.

- › **SSH prompt command** specifies an ssh-askpass command that you can use (on Linux) to prompt the user for a password when using SSH. For example, ssh-askpass or x11-ssh-askpass, depending on the ssh-askpass implementation that you use.
- › **Reset VCS Cache** resets the version control system configuration to a state known to Qt Design Studio after it has been changed from the command line, for example.

## Using Git for Windows

If you configure Git for use with `git bash`, only, and use SSH authorization, Git looks for the SSH keys in the directory where the HOME environment points to. The variable is always set by `git bash`.

However, the variable is typically not set in a Windows command prompt. When you run Git from a Windows command prompt, it looks for the SSH keys in its installation directory, and therefore, the authorization fails.

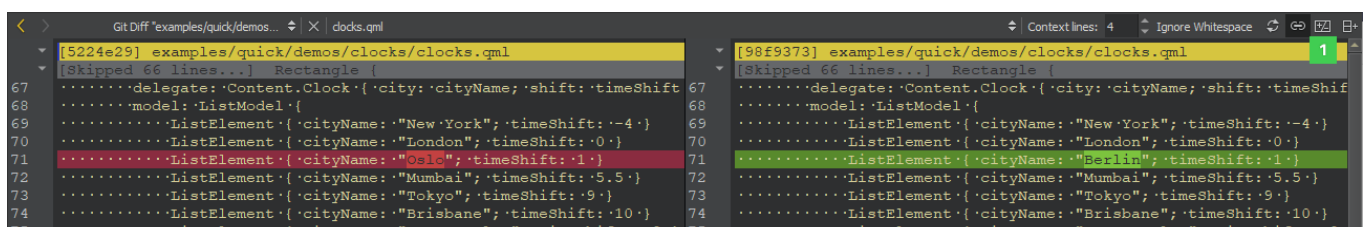
You can set the HOME environment variable from Qt Design Studio. Select **Edit > Preferences > Version Control > Git**, and then select the **Set "HOME" environment variable** check box. HOME is set to %HOMEDRIVE%%HOMEPATH% when the Git executable is run and authorization works as it would with `git bash`.

## Working with the Current File

To work with the current file, select the commands in **Tools > Git > Current File**. Some of the commands are also available for the project or local repository that contains the file.

### Viewing Git Diff

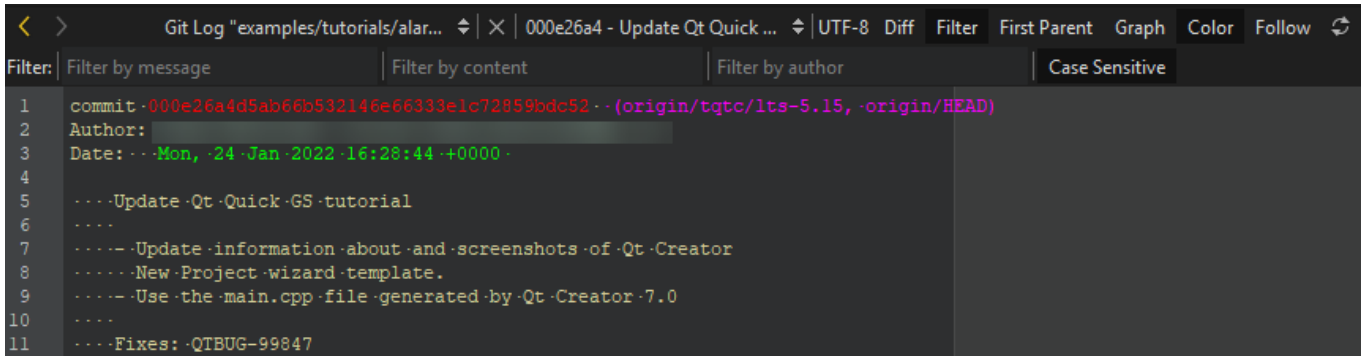
You can *diff* the current file or project to compare it with the latest version stored in the repository and to display the differences. To display the diff in a read-only editor, select **Diff of**. If the file is accessible, you can double-click on a selected diff chunk and Qt Design Studio opens an editor displaying the file, scrolled to the line in question.



The diff is displayed side-by-side in a **diff editor** by default. To use the unified diff view instead, select the **Switch to Unified Diff Editor** (1) option from the toolbar. In both views, you can use context menu commands to apply, revert, stage, and unstage chunks or selected lines, as well as send chunks to a code pasting service.

## Viewing Git Log

To display the versioning history of a file, select **Log of**. The log output contains the date, the commit message, and a commit identifier. Click on the commit identifier to view commit details.



```

1  commit 000e26a4d5ab66b532146e66333e1c72859bdc52..(origin/tqtc/lts-5.15, -origin/HEAD)
2  Author:
3  Date: Mon, 24 Jan 2022 16:28:44 +0000
4
5  --- Update Qt Quick GS tutorial
6  ---
7  --- Update information about and screenshots of Qt Creator
8  --- New Project wizard template.
9  --- Use the main.cpp file generated by Qt Creator 7.0
10 ---
11 --- Fixes: QTBUG-99847

```

Right-clicking on a commit identifier brings up a context menu that lets you apply actions on the commit, such as view annotations or cherry-pick or revert a commit. For more information, see [Working with Branches](#).

To toggle the diff view, select **Diff**. To use the patience algorithm for calculating the differences, select **Patience**. To only show text changes, select **Ignore Whitespace**.

To filter log entries by the text in the commit message, by strings that were added or removed, or by author, select **Filter**. Enter a search string in the **Filter by message**, **Filter by content**, or **Filter by author** field. Select **Case Sensitive** to make filtering consider case.

To follow only the first parent on merge commits, select **First Parent**.

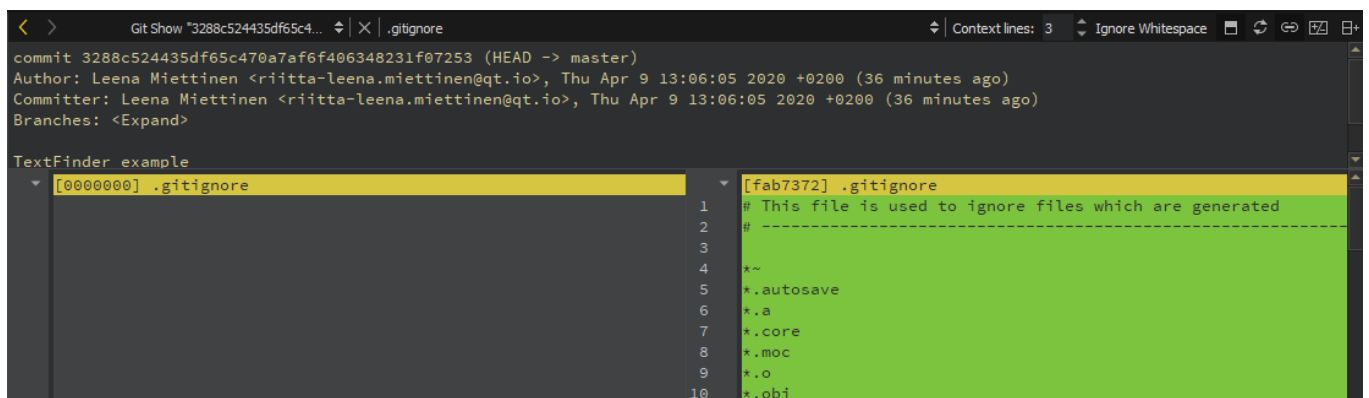
To toggle between textual and visual representation of the log, select **Graph**.

To toggle color coding of different parts of the log entries, select **Color**.

To show log also for previous names of the file, select **Follow**.

Select  (**Reload**) to rescan the files.

To display a description of the change including the diff in the **Git Show** view, select **Describe Change** in the context menu.



```

commit 3288c524435df65c470a7af6f406348231f07253 (HEAD -> master)
Author: Leena Miettinen <riitta-leena.miettinen@qt.io>, Thu Apr 9 13:06:05 2020 +0200 (36 minutes ago)
Committer: Leena Miettinen <riitta-leena.miettinen@qt.io>, Thu Apr 9 13:06:05 2020 +0200 (36 minutes ago)
Branches: <Expand>

TextFinder_example
[00000000] .gitignore
[fab7372] .gitignore
1  # This file is used to ignore files which are generated
2  # -----
3
4  *~
5  *.autosave
6  *.a
7  *.core
8  *.moc
9  *.o
10 *.obj


```

## Viewing Annotations

Originate from: clicking on the commit identifier shows a detailed description of the change.

To show the annotation of a previous version, right-click on the commit identifier and select **Blame Parent Revision**. This allows you to navigate through the history of the file and obtain previous versions of it.

The other actions in the context-menu enable you to apply actions to the commit, such as cherry-pick, checkout, or revert it.

To rescan the files, click  (**Reload**).

## Staging Changes

To mark a new or modified file for committing it to the repository, select **Stage File for Commit**. To undo this function, select **Unstage File from Commit**.

## Resetting Changes

Git has an index that is used to stage changes. The index is committed on the next commit. Git allows you to revert back to the state of the last commit as well as to the state staged in the index.

To revert all changes and reset the current file to the state of the index, select **Undo Unstaged Changes**.

To return the current file to the state it was in right after the last commit, select **Undo Uncommitted Changes**. This reverts all changes, discarding the index.

## Working with the Current Project

To work with the current project, select the commands in **Tools > Git > Current Project**. The **Diff Project** and **Log Project** commands, which are also available for the current file, are described above.

## Cleaning Projects

To clean the working directory, select **Build Project > Clean**. All files that are not under version control are displayed in the **Clean Repository** dialog. Ignored files are deselected by default. Select the files to delete and click **Delete**.

## Working with Local Repositories

To work with the local repository, select the commands in **Tools > Git > Local Repository**. The commands that are also available for the current file or project are described above.

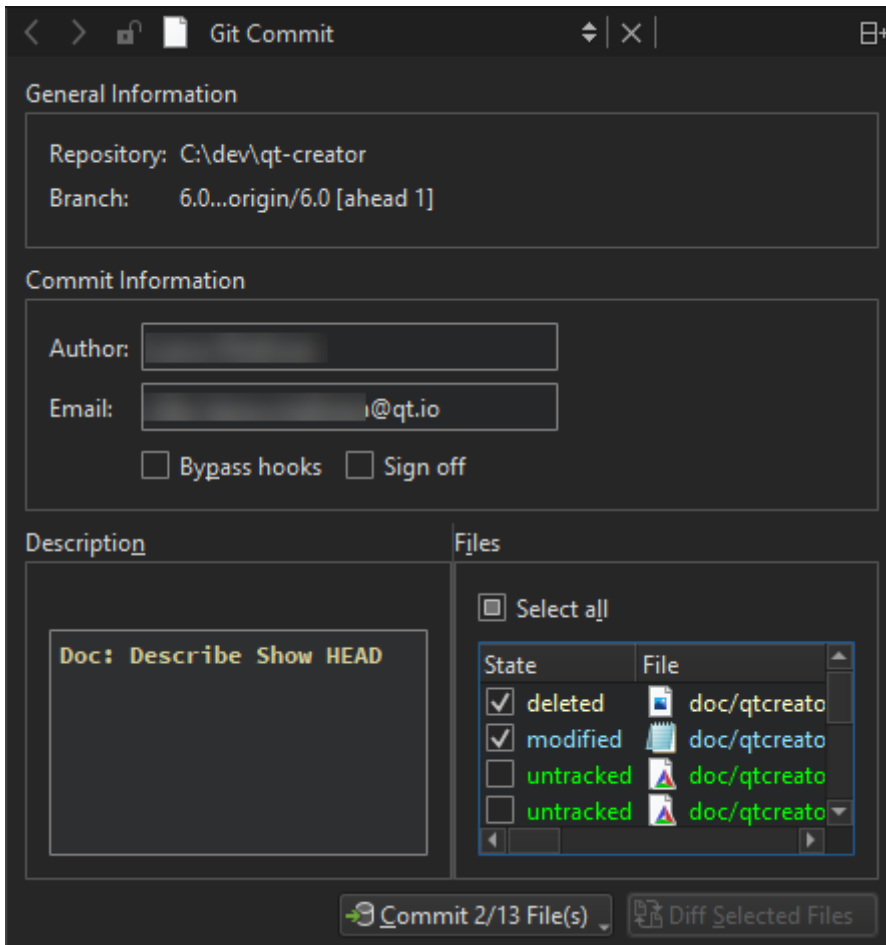
## Viewing Reference Log

Reference logs record when the tips of branches and other references were updated in the local repository. To view the reference log, select **Reflog**.

## Viewing Git Status

To view the status of the repository in **Version Control**, select **Status**. The context menu contains additional actions, such as selecting and clearing all entries, copying text, and opening files.

## Committing Changes to Git



**General Information** displays the names of the repository and branch for the commit.

In **Commit Information**, you can edit information about the author of the commit. To bypass re-commit and commit message hooks, select **Bypass hooks**. If signoffs are used for your project, select **Sign off** to add a *signed-off-by* trailer by the author at the end of the commit log message.

In **Description**, edit the commit message.

In **Files**, select the files to include in the commit.

When you have finished filling out the commit page information, click on **Commit** to start committing.

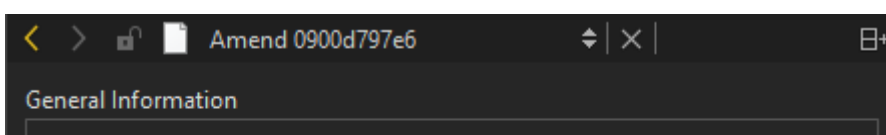
The **Diff Selected Files** button opens a **diff view** of the files selected in the file list. Select **Stage Chunk** in the context menu to stage a chunk or **Stage Selection** to stage the selected lines.

To unstage chunks or selected lines, select **Unstage Chunk** or **Unstage Selection** in the context menu. To revert the changes in a chunk, select **Revert Chunk**.

The commit page is just another editor, and therefore you return to it when you close the diff view. You can also switch to an open diff view by selecting it in the **Open Documents** view in the sidebar.

## Amending Commits

To apply latest changes to the last commit, select **Tools > Git > Local Repository > Amend Last Commit**.



[SHOW HEAD](#)

To view the commit in its current form, before amending, select **Show HEAD**.

To view a diff of the changes in the selected files, select **Diff Selected Files**.

Select **Commit** to amend the commit.

To amend an earlier comment in a series of related commits, select **Tools > Git > Local Repository > Fixup Previous Commit**. This operation is done using interactive rebase. In case of conflicts, a merge tool is suggested.

## Resetting Local Repository

To reset changes, select **Reset**. This opens a dialog where you can select the commit to reset the working directory to. This is useful after applying patches for review, for example. You can choose between a **Soft** reset that does not touch the index file nor the working tree at all, a **Hard** reset that discards all changes to tracked files in the working tree, and a **Mixed** reset that resets HEAD and the index (nothing remains staged) without touching the working directory.

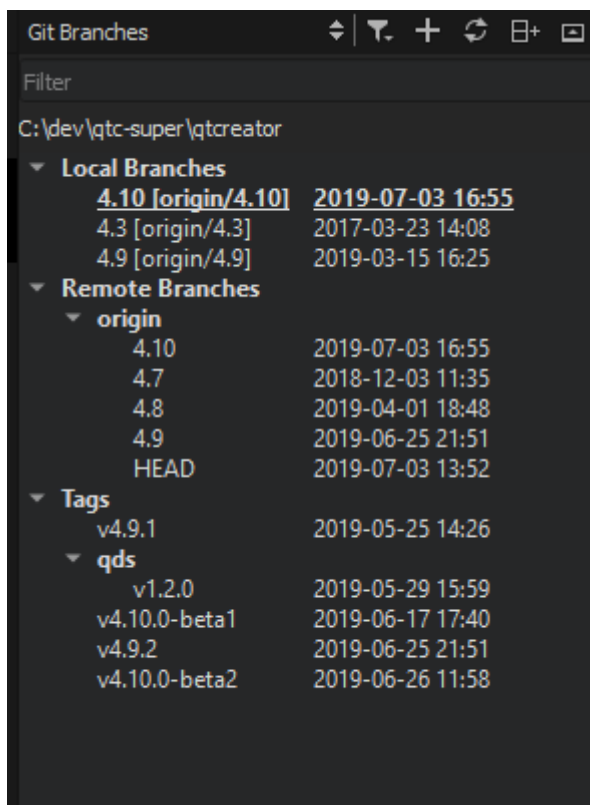
To recover removed files, select **Recover Deleted Files**.

To change a series of commits in the local repository, select **Interactive Rebase**. You can reorder or discard commits, squash them into a single commit, or edit the commit messages.

If you already pushed the local changes to a remote, Qt Design Studio refuses the interactive rebase because the local commits are missing. To start the interactive rebase from the change log, select **Branches > Log**. Select the change, and then select **> Interactive Rebase from Change** in the context menu.

## Working with Branches

To work with Git branches, select **Branches**. The checked out branch is shown in bold and underlined in the list of branches in the **Git Branches** sidebar view.



To add a tag to a change in the change log, select **Branches > Log**. Select the change, and then select **Add Tag for Change** in the context menu.

If you checked out a specific commit, the list of branches displays a *Detached HEAD* entry.

For local and remote branches, the changes log can be shown by double clicking on the branch name.

To refresh the list of branches, click  (**Refresh**).

The following operations are supported in the context-menu for a branch:

| Menu Item          | Description  |
|--------------------|--|
| <b>Add</b>         | Create new tracking and non-tracking branches.   |
| <b>Remove</b>      | Remove a local branch. You cannot delete remote branches.  |
| <b>Rename</b>      | Rename a local branch or a tag. You cannot rename remote branches.   |
| <b>Checkout</b>    | Check out the selected branch and make it current. You can stash changes you have made to tracked files.   |
| <b>Diff</b>        | Show the differences between the selected and the current branch.  |
| <b>Log</b>         | Show the changes in a branch.  |
| <b>Reset</b>       | Reset the active branch to the selected branch. You can choose between a <b>Hard</b> , <b>Mixed</b> , and <b>Soft</b> reset. For more information, see <a href="#">Resetting Local Repository</a> .  |
| <b>Merge</b>       | Join the development histories in two branches together.<br>If the commit you are merging can be reached by following the first commit's history, there is no divergent work to merge together. To allow Git to move the branch pointer forward, select <b>Merge (Fast-Forward)</b> . If you do not want to fast-forward the branch, select <b>Merge (No Fast-Forward)</b> . |
| <b>Rebase</b>      | Copy local commits to the updated upstream head.   |
| <b>Cherry Pick</b> | Cherry pick the top commit from the selected branch.   |
| <b>Track</b>       | Set the current branch to track the selected one.  |
| <b>Push</b>        | Push the committed changes to the selected remote branch.  |

The following additional context-menu operations are available for **Remote Branches**. The context-menu can be opened on **Remote Branches** or on a specific remote repository.

| Menu Item             | Description  |
|-----------------------|--|
| <b>Fetch</b>          | Fetch all the branches and changes information from a specific remote repository, or from all remotes if applied to <b>Remote Branches</b> . |
| <b>Manage Remotes</b> | Open the <b>Remotes</b> dialog.  |

## Configuring Merge Tools

Only graphical merge tools are supported. You can configure the merge tool to use on the command line. For example, to use the **KDiff3** merge tool, enter the following command:

## Applying Patches

Patches are rewriting instructions that can be applied to a set of files. To apply a patch file that is open in Qt Design Studio, select **Patch > Apply from Editor**.

To select the patch file to apply from the file system, select **Apply from File**.

## Using Stashes

With Git, you can put your current set of changes onto a virtual shelf called a *stash*. Stashes are useful, for example, to put aside a set of changes to work on higher priority tasks or to pull in new changes from another repository.

To stash all local changes, select **Stash > Stash**. The working copy is reset to the state it had after the last commit. To save the current state of your unstaged files and reset the repository to its staged state, select **Stash Unstaged Files**.

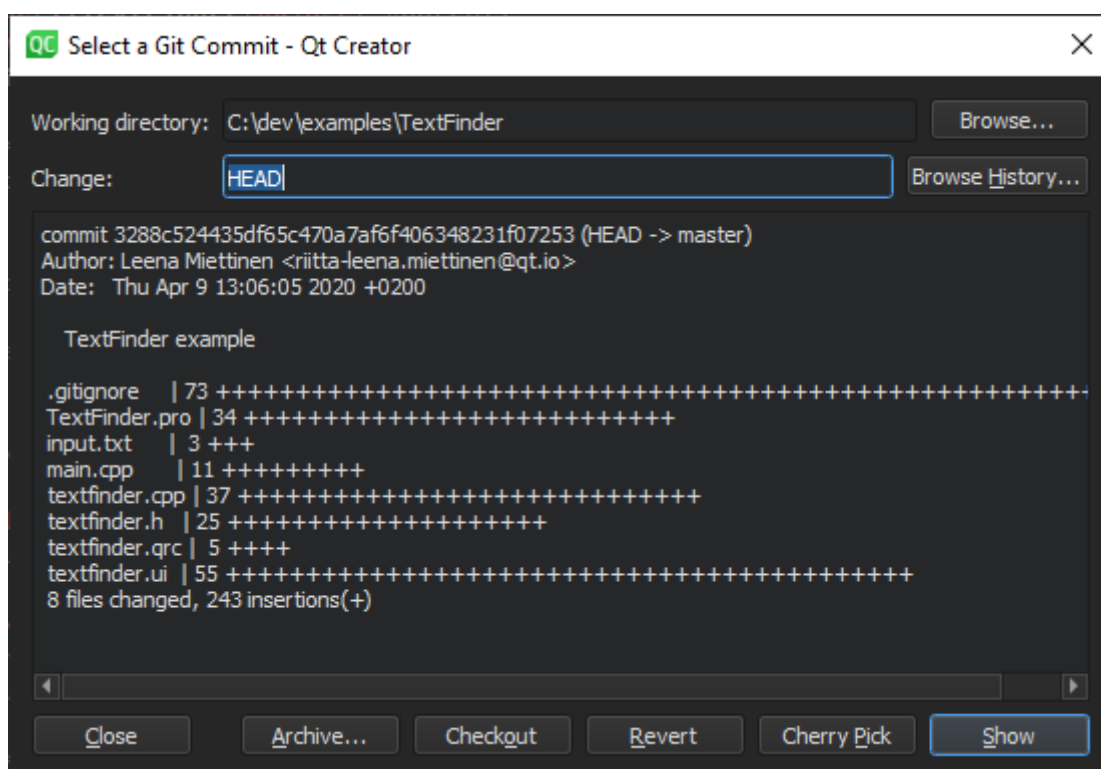
To display a dialog that shows all known stashes with options to restore, display or delete them, select **Stashes**.

To save a snapshot of your current work under a name for later reference, select **Take Snapshot**. The working copy is unchanged. For example, if you want to try something and find out later that it does not work, you can discard the changes and return to the state of the snapshot.

To remove a single stashed state from the stash list and apply it on top of the current working tree state, select **Stash Pop**.

## Applying Actions to Commits

To browse a directory or the commit history and to apply actions on the commits, select **Tools > Git > Actions on Commits**.





| Menu Item          | Description  |
|--------------------|--|
| <b>Archive</b>     | Package the commit as a ZIP or tarball.                  |
| <b>Checkout</b>    | Check out the change in a headless state.                |
| <b>Cherry Pick</b> | Cherry-pick the selected change to the local repository. |
| <b>Revert</b>      | Revert back to the state of the last commit.             |
| <b>Show</b>        | Show the commit in the diff editor.                      |

## Initializing Git Repositories

To start controlling a project directory that is currently not under version control, select **Tools > Git > Create Repository**. Qt Design Studio creates a new subdirectory named `.git` that contains all the necessary repository files. However, nothing in the project is tracked yet, so you will need to create an initial commit to start tracking the project files.

## Working with Remote Repositories

To work with remote repositories, select the commands in **Tools > Git > Remote Repository**.

To fetch all the branches and change information from a remote repository, select **Fetch**.

To pull changes from the remote repository, select **Pull**. If there are locally modified files, you are prompted to stash the changes. Select **Edit > Preferences > Version Control > Git** and then select the **Pull with rebase** check box to perform a rebase operation while pulling.

To push committed changes to the remote repository, select **Push**. If the local branch does not have an upstream branch in the remote repository, Qt Design Studio prompts you to create it and set it as upstream.

## Managing Remote Repositories

To manage remote repositories available in Git, select **Tools > Git > Remote Repository > Manage Remotes**. Double-click the names and URLs of the remote repositories to edit them.

The following operations are supported:

| Menu Item      | Description   |
|----------------|---|
| <b>Refresh</b> | Refresh the list of remote repositories.                                |
| <b>Add</b>     | Add a new remote repository.  |
| <b>Fetch</b>   | Fetch all the branches and change information from a remote repository. |
| <b>Push</b>    | Push committed changes to the remote repository.                        |
| <b>Remove</b>  | Remove a remote repository.   |

## Using Git with Subversion

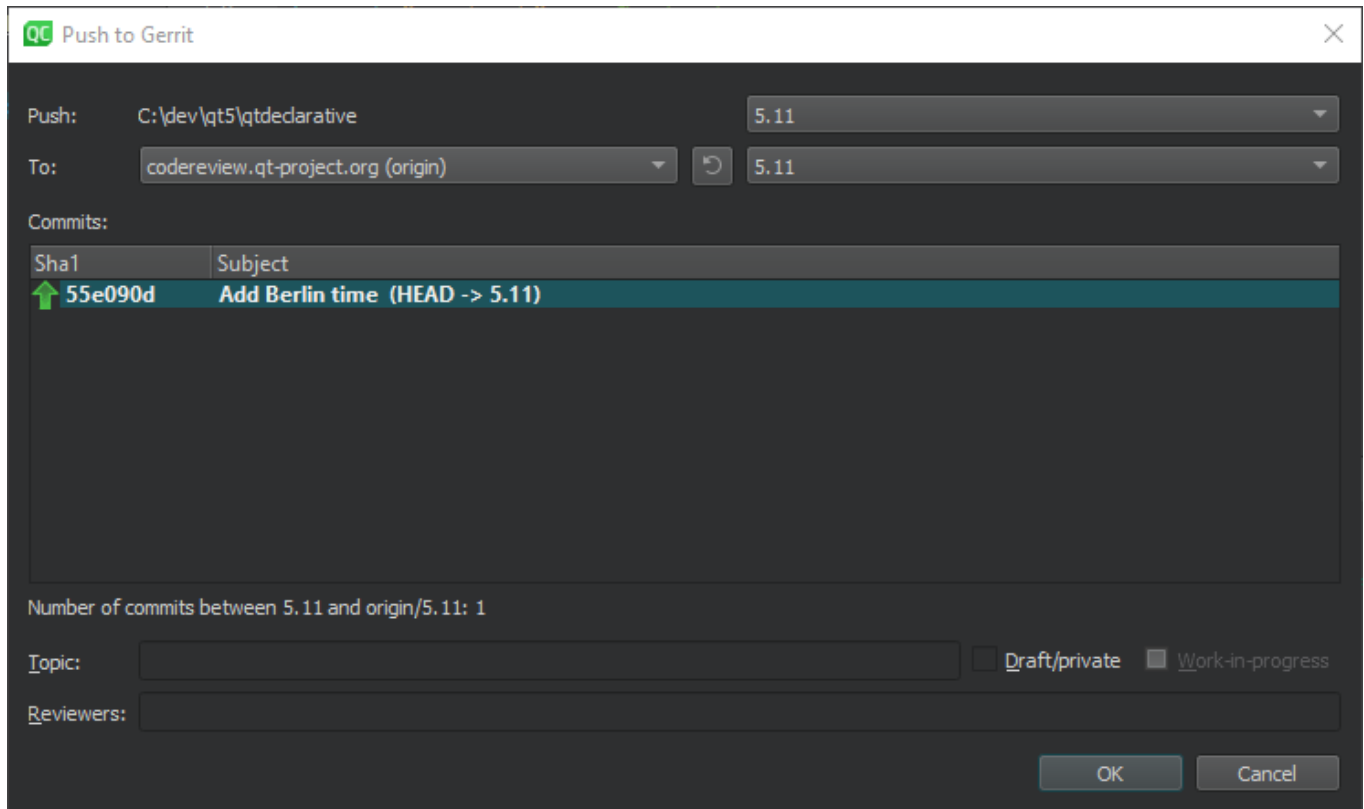
You can use Git as a client for a Subversion server. To fetch changes from a Subversion repository to a Git repository, select **Tools > Git > Remote Repository > Subversion > Fetch**.

revision in Subversion for every local Git commit. Afterwards, the branch is rebased or reset (depending on whether or not there is a diff between Subversion and head).

## Reviewing Code with Gerrit

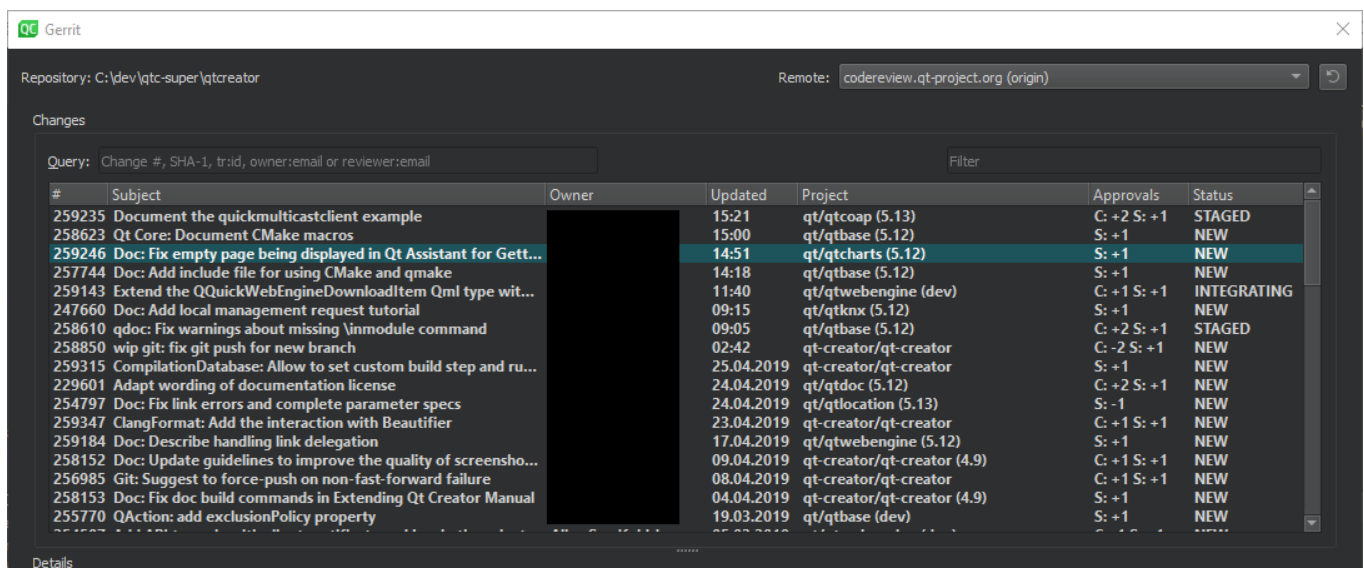
If your Git project uses Gerrit for code reviews, you can view your changes in Qt Design Studio.

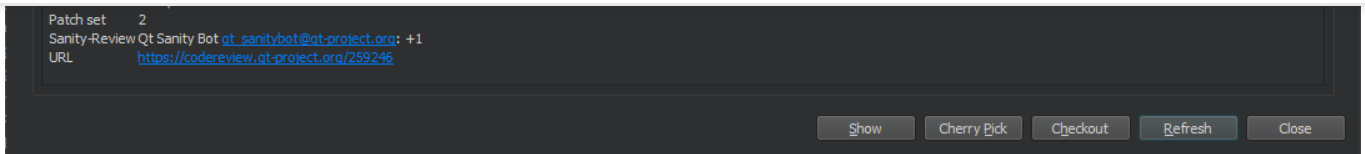
To push committed changes to Gerrit, select **Tools > Git > Remote Repository > Push to Gerrit**.



Select the **Draft/private** check box to push changes that are only visible to you and the reviewers. If you are using Gerrit 2.15 or later, you can select the **Work-in-progress** check box to push changes that do not generate email notifications.

To view the same information about each change as in the Gerrit web interface, select **Tools > Git > Remote Repository > Gerrit**.





To view details of the selected change, select **Show**.

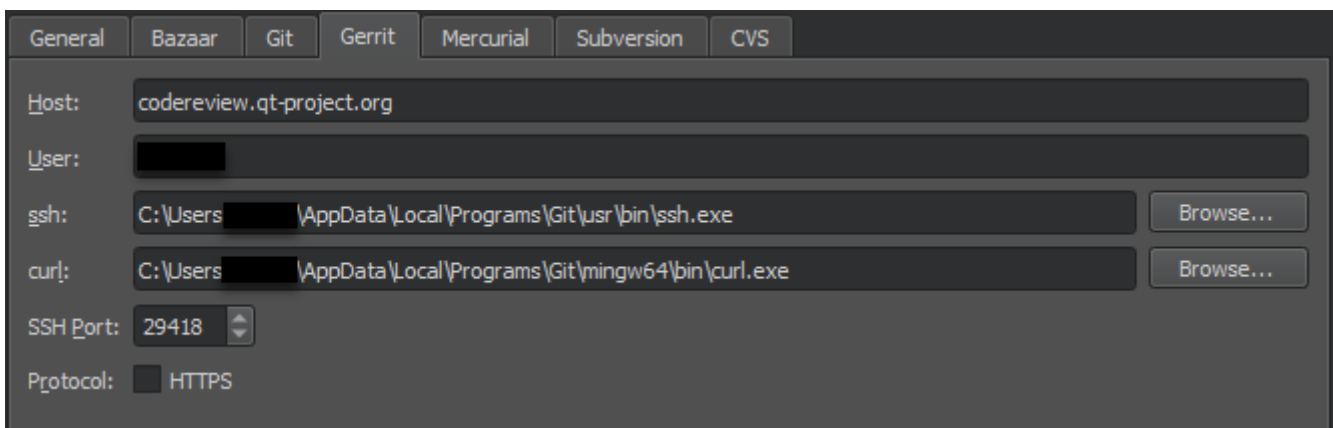
To cherry-pick the selected change to the local repository, select **Cherry Pick**. To remove the change after testing it, select **Tools > Git > Local Repository > Reset**. In the **Undo Changes to** dialog, select the state to reset the working directory to, and then select **OK**.

To check out the change in a headless state, select **Checkout**.

To refresh the list of changes, select **Refresh**.

The **Remote** field lists the remotes of the current repository that are detected as Gerrit servers. Select **Edit > Preferences > Version Control > Gerrit** to specify a fallback connection to a Gerrit server over SSH. The Gerrit REST interface and the **curl** tool are used for HTTP connections.

Select the **HTTPS** check box to prepend **https** to the Gerrit URL if Gerrit does not provide it.



## Working with Git Tools

To start a graphical interface to Git, select **Tools > Git > Git Tools > Git Gui**.

**Note:** On macOS, the default Git installation does not contain Git Gui. To use Git Gui, install it separately. To start Git Gui from Qt Design Studio, select **Preferences > Version Control > Git**, and set the path to the environment that contains Git Gui in the **Prepend to PATH** field.

To start the commit viewer for Git, select **Tools > Git > Git Tools > Gitk**. You can also start the tool to view commits in the current document or in the folder that contains the current document. To specify arguments for running Gitk, select **Edit > Preferences > Version Control > Git**.

To use some other application for viewing Git history, such as GitX or QGit viewer, select **Edit > Preferences > Version Control > Git** and specify the path to the application executable in the **Command** field. To start the application, select **Tools > Git > Git Tools > Repository Browser**.

To start `git bash`, select **Tools > Git > Git Tools > Git Bash**.

To resolve merge conflicts, select **Tools > Git > Git Tools > Merge Tool**. This menu item is visible only when you have merge conflicts to resolve.



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