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Git Branch

This document is an in-depth review of the `git branch` command and a discussion of the overall Git branching model. Branching is a feature available in most modern version control systems. Branching in other VCS's can be an expensive operation in both time and disk space. In Git, branches are a part of your everyday development process.

Git branches are effectively a pointer to a snapshot of your changes. When you want to add a new feature or fix a bug–no matter how big or how small–you spawn a new branch to encapsulate your changes. This makes it harder for unstable code to get merged into the main code base, and it gives you

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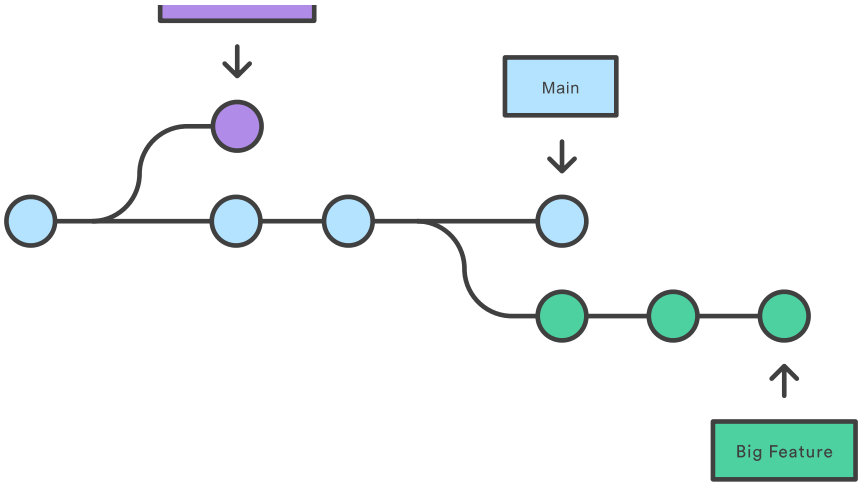

The diagram above visualizes a repository with two isolated lines of development, one for a little feature, and one for a longer-running feature. By developing them in branches, it's not only possible to work on both of them in parallel, but it also keeps the `main` branch free from questionable code.

The implementation behind Git branches is much more lightweight than other version control system models. Instead of copying files from directory to directory, Git stores a branch as a reference to a commit. In this sense, a branch represents the tip of a series of commits–it's not a container for commits. The history for a branch is extrapolated through the commit relationships.

As you read, remember that Git branches aren't like SVN branches. Whereas SVN branches are only used to capture the occasional large-scale development effort, Git branches are an integral part of your everyday workflow. The following content will expand on the internal Git branching architecture.

How it works

A branch represents an independent line of development. Branches serve as an abstraction for the edit/stage/commit process. You can think of them as a way to request a brand new working directory, staging area, and project history. New commits are recorded in the history for the current branch, which results in a fork in the history of the project.

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`git branch` is tightly integrated with the `git checkout` and `git merge` commands.

Common options

```
git branch
```

List all of the branches in your repository. This is synonymous with `git branch --list`.

```
git branch <branch>
```

Create a new branch called `<branch>`. This does *not* check out the new branch.

```
git branch -d <branch>
```

Delete the specified branch. This is a “safe” operation in that Git prevents you from deleting the branch if it has unmerged changes.

```
git branch -D <branch>
```

Force delete the specified branch, even if it has unmerged changes. This is the command to use if you want to permanently throw away all of the commits associated with a particular line of development.

```
git branch -m <branch>
```

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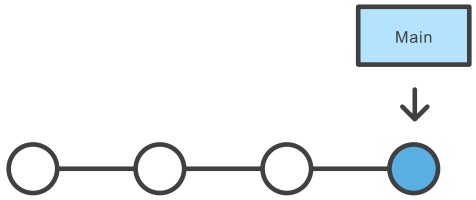
```
git branch -a
```

List all remote branches.

Creating branches

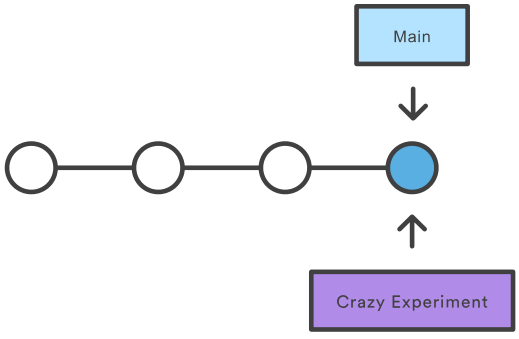
It's important to understand that branches are just pointers to commits. When you create a branch, all Git needs to do is create a new pointer, it doesn't change the repository in any other way. If you start with a repository that looks like this:



Then, you create a branch using the following command:

```
git branch crazy-experiment
```

The repository history remains unchanged. All you get is a new pointer to the current commit:



Note that this only *creates* the new branch. To start adding commits to it, you need to select it with `git checkout`, and then use the standard `git add` and `git commit` commands.

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So far these examples have all demonstrated local branch operations. The `git branch` command also works on remote branches. In order to operate on remote branches, a remote repo must first be configured and added to the local repo config.

```
$ git remote add new-remote-repo https://bitbucket.com/user/repo.git
# Add remote repo to local repo config
$ git push <new-remote-repo> crazy-experiment~
# pushes the crazy-experiment branch to new-remote-repo
```

This command will push a copy of the local branch `crazy-experiment` to the remote repo `<remote>`.

Deleting branches

Once you've finished working on a branch and have merged it into the main code base, you're free to delete the branch without losing any history:

```
git branch -d crazy-experiment
```

However, if the branch hasn't been merged, the above command will output an error message:

```
error: The branch 'crazy-experiment' is not fully merged. If you are s
```

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```
git branch -D crazy-experiment
```

This deletes the branch regardless of its status and without warnings, so use it judiciously.

The previous commands will delete a local copy of a branch. The branch may still exist in remote repos. To delete a remote branch execute the following.

```
git push origin --delete crazy-experiment
```

or

```
git push origin :crazy-experiment
```

This will push a delete signal to the remote origin repository that triggers a delete of the remote `crazy-experiment` branch.

Summary

In this document we discussed Git's branching behavior and the `git branch` command. The `git branch` commands primary functions are to create, list, rename and delete branches. To operate further on the resulting branches the command is commonly used with other commands like `git checkout`. Learn more about `git checkout` branch operations; such as switching branches and merging branches, on the `git checkout` page.

Compared to other VCSs, Git's branch operations are inexpensive and frequently used. This flexibility enables powerful Git workflow customization. For more info on Git workflows visit

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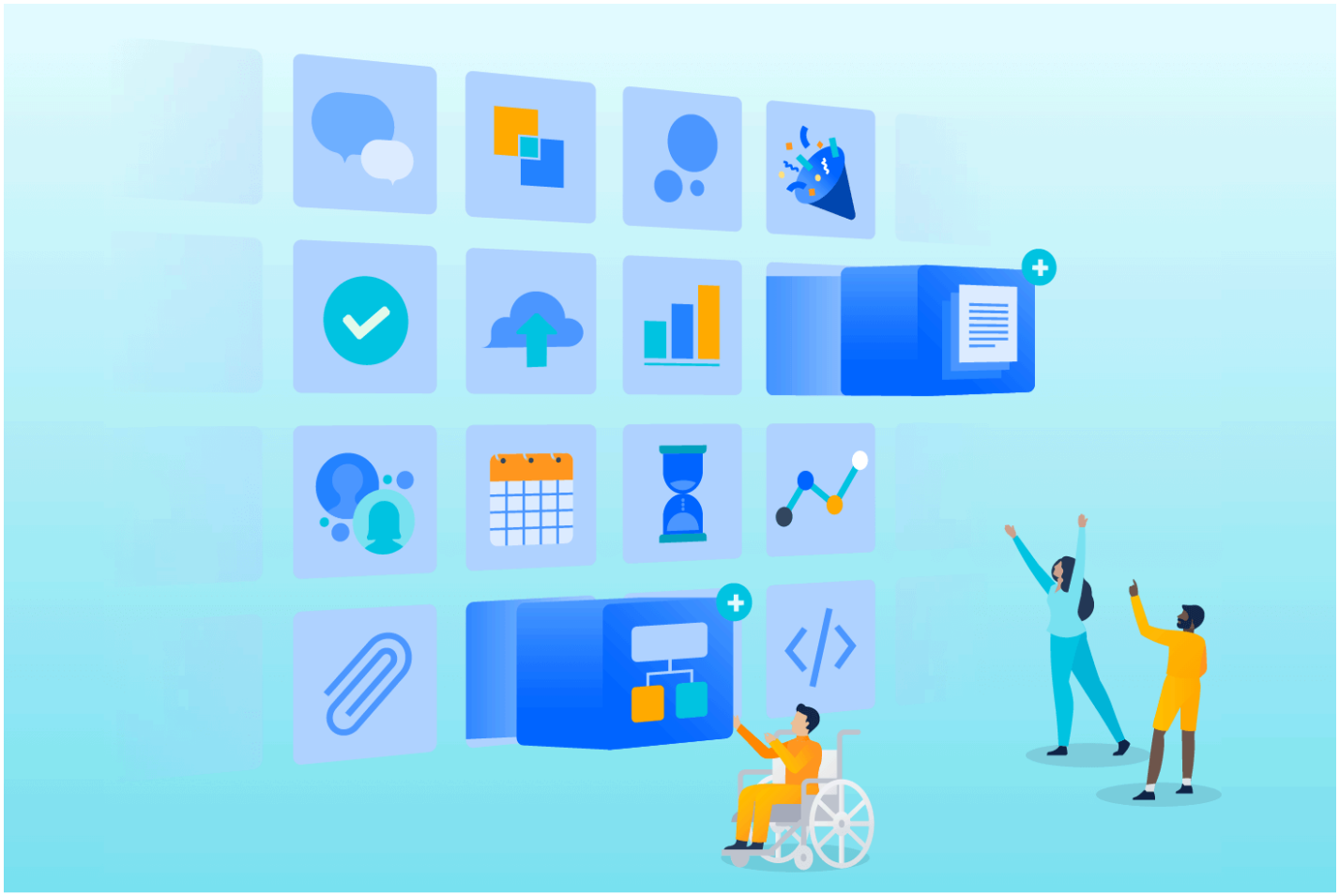

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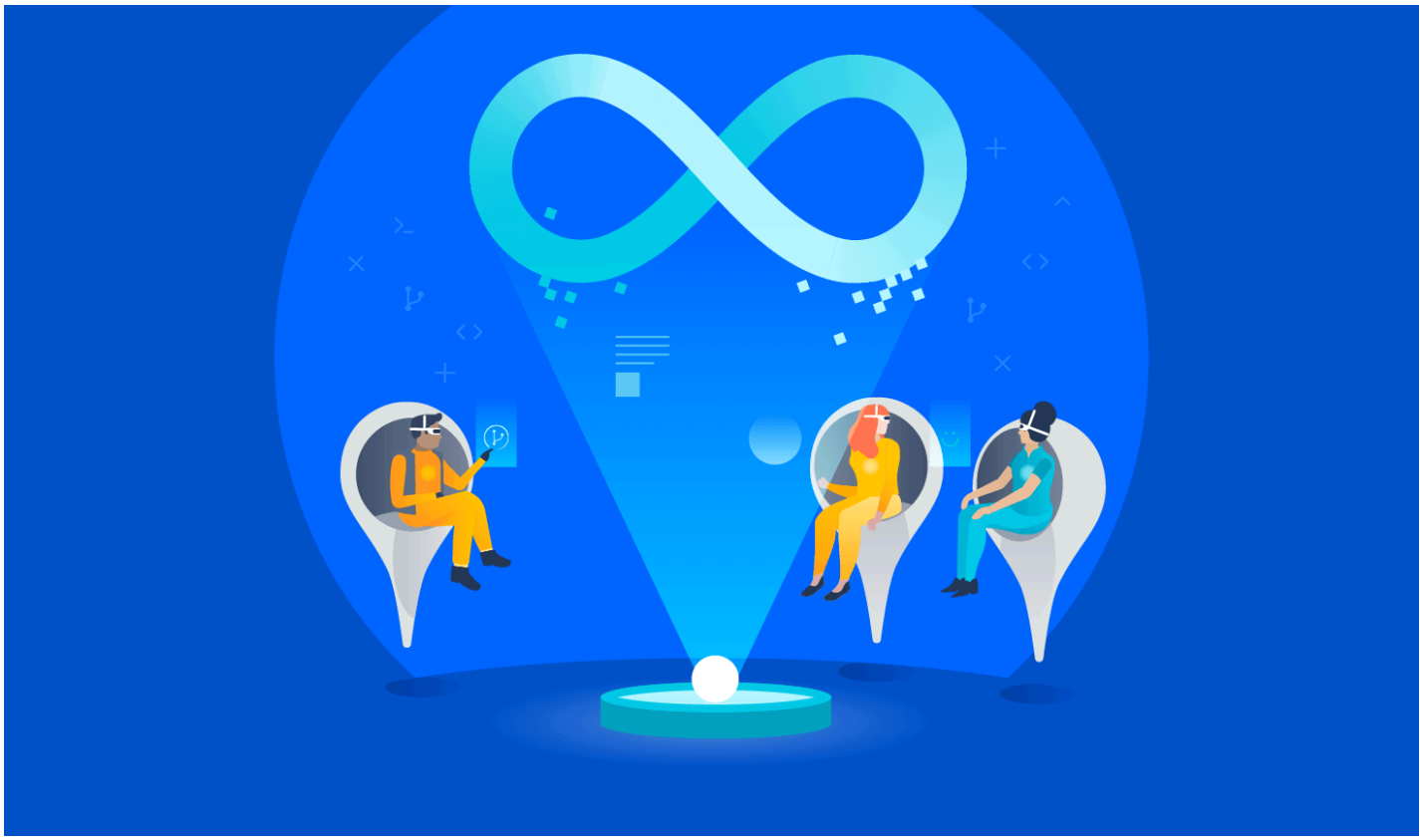

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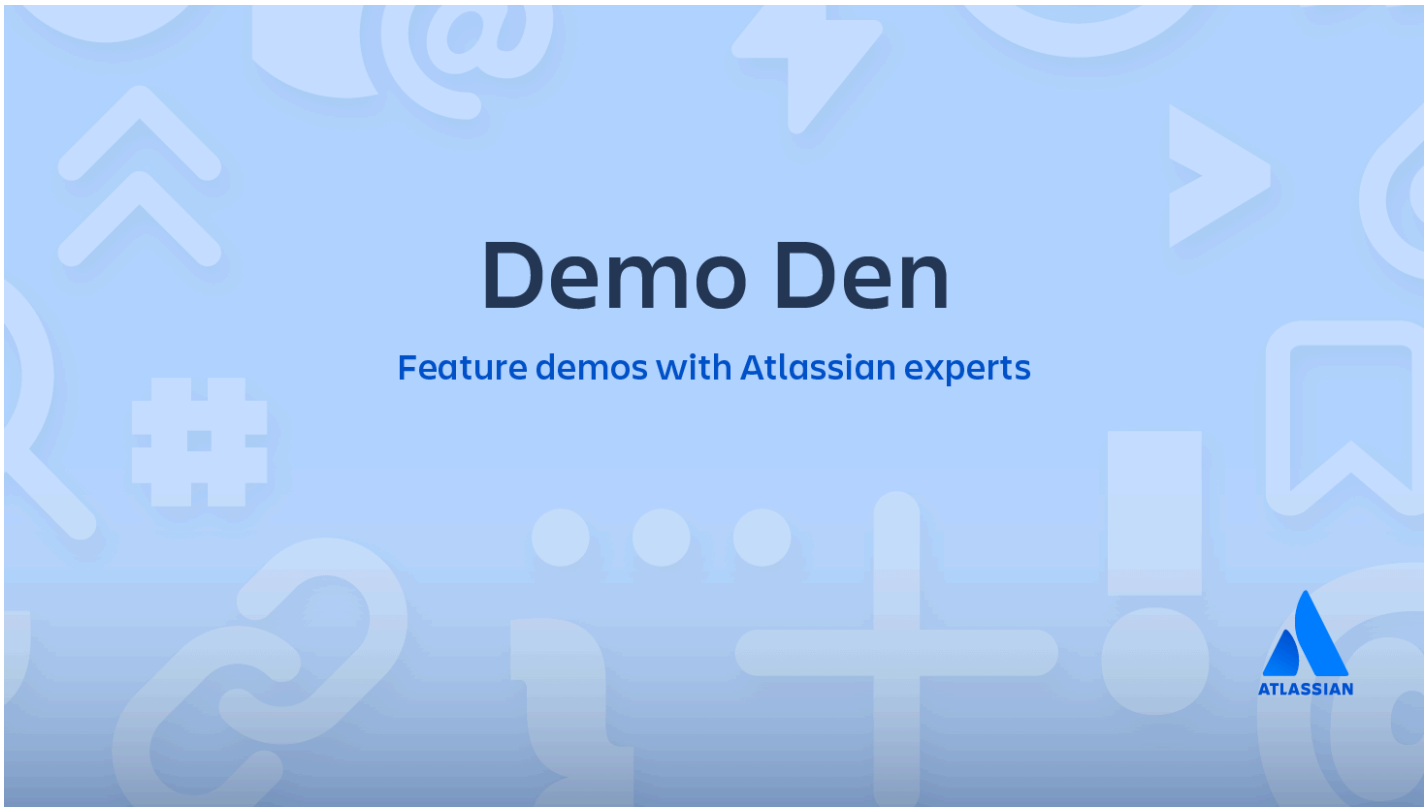

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