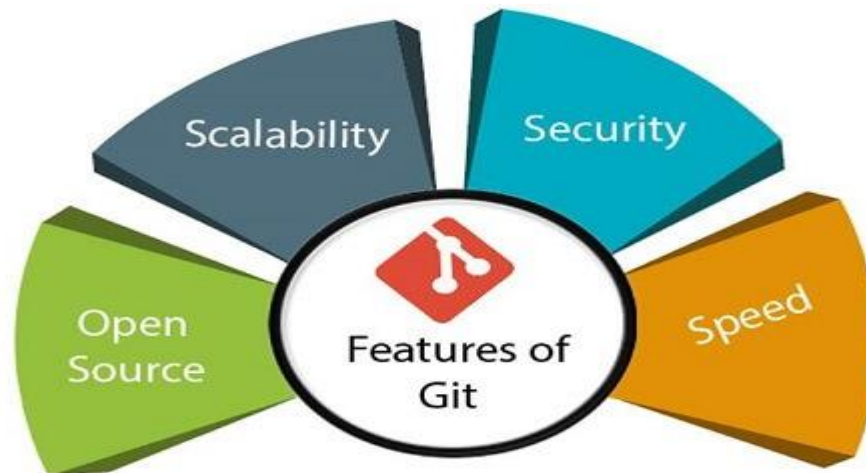## What is Git?

Git is an **open-source distributed version control system**. It is designed to handle minor to major projects with high speed and efficiency. It is developed to co-ordinate the work among the developers. The version control allows us to track and work together with our team members at the same workspace.

Features of Git

- ○ **Open**   **Source**
  Git is an **open-source tool**. It is released under the **GPL** (General Public License) license.
- ○ **Scalable**
  Git is **scalable**, which means when the number of users increases, the Git can easily handle such situations.

Distributed
One of Git's great features is that it is **distributed**. Distributed means that instead of switching the project to another machine, we can create a "clone" of the entire repository.

- ○ **Security**
  Git is secure. It uses the **SHA1 (Secure Hash Function)** to name and identify objects within its repository. Files and commits are checked and retrieved by its checksum at the time of checkout. It stores its history in such a way that

the ID of particular commits depends upon the complete development history leading up to that commit. Once it is published, one cannot make changes to its old version.

- **Speed**

  Git is very **fast**, so it can complete all the tasks in a while. Most of the git operations are done on the local repository, so it provides a **huge speed**. Also, a centralized version control system continually communicates with a server somewhere.

  Performance tests conducted by Mozilla showed that it was **extremely fast compared to other VCSs**. Fetching version history from a locally stored repository is much faster than fetching it from the remote server. The **core part of Git** is **written in C**, which **ignores** runtime overheads associated with other high-level languages. Git was developed to work on the Linux kernel; therefore, it is **capable** enough to **handle large repositories** effectively. From the beginning, **speed** and **performance** have been Git's primary goals.

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  <u>**Branching and merging**</u> are the **great feature**s of Git, which makes it different from the other SCM tools. Git allows the **creation of multiple branches** without affecting each other. We can perform tasks like **creation**, **deletion**, and **merging** on branches, and these tasks take a few seconds only. Below are some features that can be achieved by branching:

  - We can **create a separate branch** for a new module of the project, commit and delete it whenever we want.
  - We can have a **production branch**, which always has what goes into production and can be merged for testing in the test branch.
  - We can create a **demo branch** for the experiment and check if it is working. We can also remove it if needed.
  - The core benefit of branching is if we want to push something to a remote repository, we do not have to push all of our branches. We can select a few of our branches, or all of them together.

<u>Benefits of Git</u>
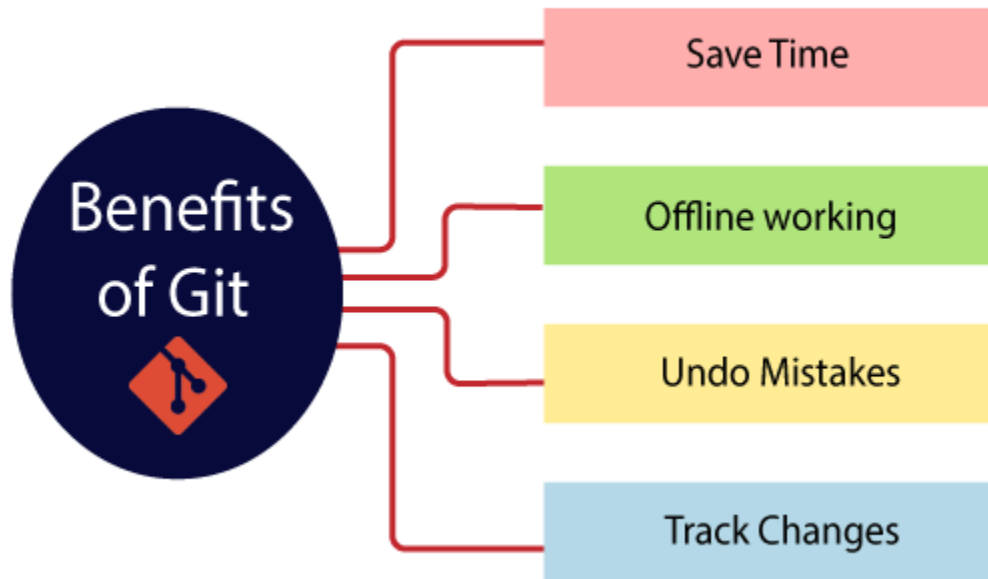
- o **Saves Time**
  Git is lightning fast technology. Each command takes only a few seconds to execute so we can save a lot of time as compared to login to a GitHub account and find out its features.

- o **Offline Working**
  One of the most important benefits of Git is that it supports **offline working**. If we are facing internet connectivity issues, it will not affect our work. In Git, we can do almost everything locally. Comparatively, other CVS like SVN is limited and prefer the connection with the central repository.

- o **Undo Mistakes**
  One additional benefit of Git is we can **Undo** mistakes. Sometimes the undo can be a savior option for us. Git provides the undo option for almost everything.

- o **Track the Changes**
  Git facilitates with some exciting features such as **Diff, Log,** and **Status**,

which allows us to track changes so we can **check the status, compare** our files or branches.

Difference Between Git and GitHub

Git: Git is a distributed version control system for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files. Its goals include speed, data integrity, and support for distributed, non-linear workflows.

GitHub: GitHub is a web-based Git repository hosting service, which offers all of the distributed revision control and source code management (SCM) functionality of Git as well as adding its own features.

S.No.	Git	GitHub
1.	Git is a software.	GitHub is a service.
2.	Git is a command-line tool	GitHub is a graphical user interface
3.	Git is installed locally on the system	GitHub is hosted on the web
4.	Git is maintained by linux.	GitHub is maintained by Microsoft.
5.	Git is focused on version control and code sharing.	GitHub is focused on centralized source code hosting.
6.	Git is a version control system to manage source code history.	GitHub is a hosting service for Git repositories.

S.No.	Git	GitHub
7.	Git was first released in 2005.	GitHub was launched in 2008.
8.	Git has no user management feature.	GitHub has a built-in user management feature.

How to download Git?

To download the Git installer, visit the Git's official site and go to download page. The link for the download page is https://git-scm.com/downloads