# GIT

## Introduction

# Agenda

- What is GIT?
- Why Use Git?
- Key Concepts
- Basic Git Workflow
- Popular Platforms
- Real-World Use cases
- Next steps

# What is Git ?

Git is a **distributed version control system** used to track changes in source code.
It allows developers to **collaborate** efficiently and maintain a history of revisions.
Key Features:

- **Distributed Nature:** Everyone has the full project history.
- **Lightweight:** Operates efficiently, even for large repositories.
- **Widely Adopted:** Forms the backbone of platforms like GitHub.

# Why Use GIT?

**Track Changes Over Time:** Keeps a detailed history of your project.

**Enable Collaboration:** Multiple people can work on the same project.

**Branching and Experimentation:** Test new ideas without affecting the main code.

**Conflict Management:** Helps resolve code conflicts when merging.

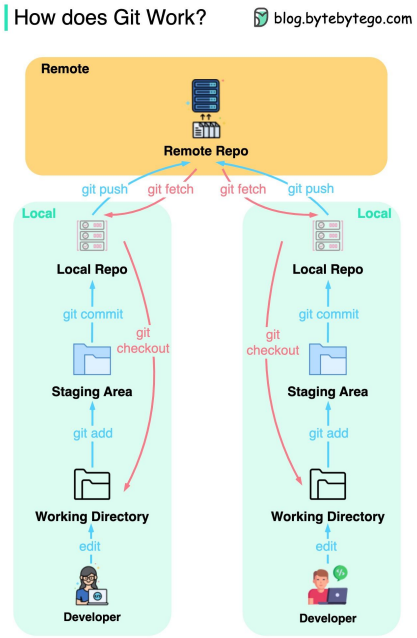
**Industry Standard:** Trusted by developers worldwide for its reliability.

# Key Concepts

**3-Tier Architecture of Git**:

- **Working Directory**:
  - Local environment where files are modified.
  - This is where changes are made before being staged.
- **Staging Area (Index)**:
  - Temporary space where changes are staged before committing.
  - Allows users to review changes and organize commits.
- **Repository (Local/Remote)**:
  - The final storage for committed changes.
  - Contains the full history of all commits, both local and remote (e.g., GitHub, GitLab).

# Continue


How does Git Work?
blog.bytebytego.com
Remote
Remote Repo
git push
git fetch
git fetch
git push
Local
Local Repo
git commit
git checkout
Staging Area
git add
Working Directory
edit
Developer
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# Basic Git Workflow

1. **Clone:** Copy a remote repository to your computer.
   `git clone <repository-url>`

2. **Modify:** Edit files and make improvements.

3. **Stage:** Add changes to the staging area.
   `git add <file-name>`

4. **Commit:** Save a snapshot of your changes.
   `git commit -m "Message describing changes"`

5. **Push:** Upload changes to the remote repository.
   `git push`

# Popular Platforms

**GitHub:** Open-source hosting and project management.

**GitLab:** Integrated DevOps platform.

**Bitbucket:** Great for private repositories and team collaboration.

**Use Cases:**
Open-source contributions
Team-based projects
Continuous Integration/Delivery (CI/CD) pipelines

# Real - World Use Cases

**Team Collaboration:** Teams building software collaboratively.

**Open-Source Development:** Contributions to public projects.

**Documentation Versioning:** Track changes in text, code, or multimedia files.

**Experimentation:** Testing features on branches before merging.
(Show examples of real-world projects or GitHub profiles.)

# Next Steps

**Install Git:** Learn how to download and set up Git.

**Run Basic Commands:**

- git init to create a repository.
- git add to stage changes.
- git commit to save changes.
- git push to upload to a remote repository.

**Explore GitHub:** Set up a repository and collaborate.

Resources for Learning: Git documentation, tutorials, and guides.