SESSION 1

GETTING STARTED WITH GIT

OBJECTIVES

- **Understand what is Version Control & the need for it**
- **Learn Basic overview of Git**
- **Understand GIT's Approach to Version Control**
- **Learn terminology of Git**

VERSION CONTROL

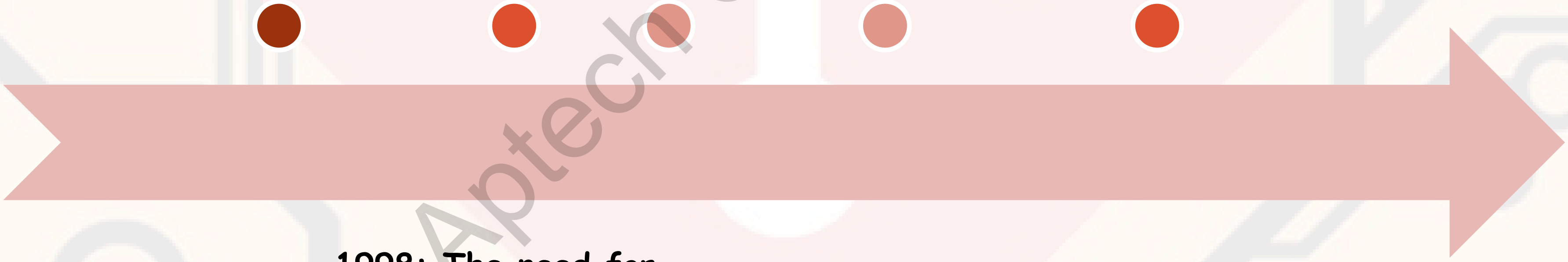
What is Version Control and How it works

Need for Version Control

Uses of Version Control

DEFINITION AND A BRIEF HISTORY

- GIT is globally a standard for version control and is the most widely used modern version control system



1991: Development begins on the Linux Kernel

1998: The need for version control is felt as the project expands

2002: The founder, Linus Torvalds, starts using BitKeeper

2005: Linus Torvalds developed and released Git after BitKeeper revokes the license for free use

2016: Git becomes the most widely used version control system by developers

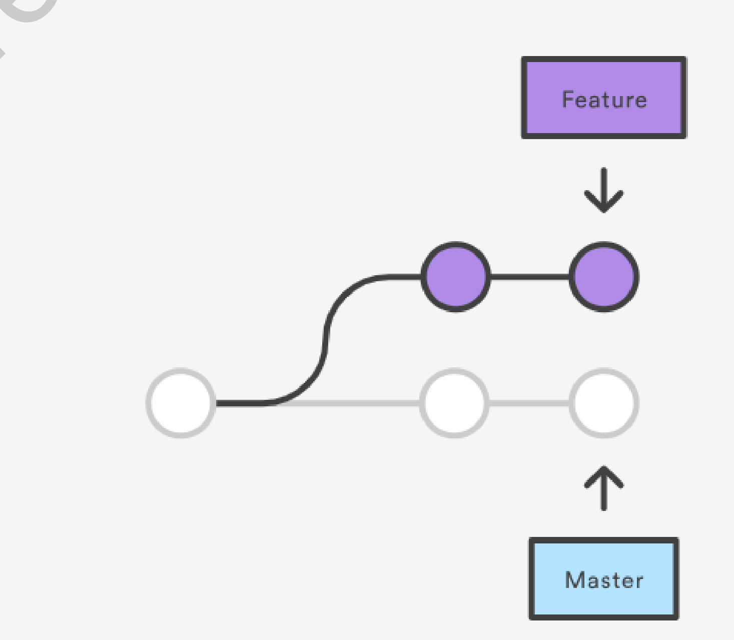
BASICS OF GIT 1-5

Branching in Git | Approaches to Versions | Focus on Locality and Integrity | States and Sections in Git | Git Repositories

Overview

- Most unique feature of GIT is the provision of Branching
- Git branches are cheap and easy to merge. This facilitates the feature branch workflow popular with many Git users

- **Advantages**
  - Context Switching is Easy
  - Role-based code lines are possible
  - Feature based workflows are possible



BASICS OF GIT 2-5

Overview

- Git's approach to versions is fundamentally different. It stores data as a sequence of snapshots of a set of files.
- If there is a file that has no changes, the file is not stored again.

BASICS OF GIT 3-5

Branching in Git

Approaches to Versions

Focus on Locality and Integrity

States and Sections in Git

Git Repositories

Overview

- Git is much faster than other version control systems as most operations require only the user's local files and resources to work. The dependence on a network is minimized.
- Git maintains integrity by using a checksum. Each entity stored is referred to by its checksum. Thus, there remains no way for a file or directory to be changed, without Git being notified of it.

BASICS OF GIT 4-5

Branching in Git

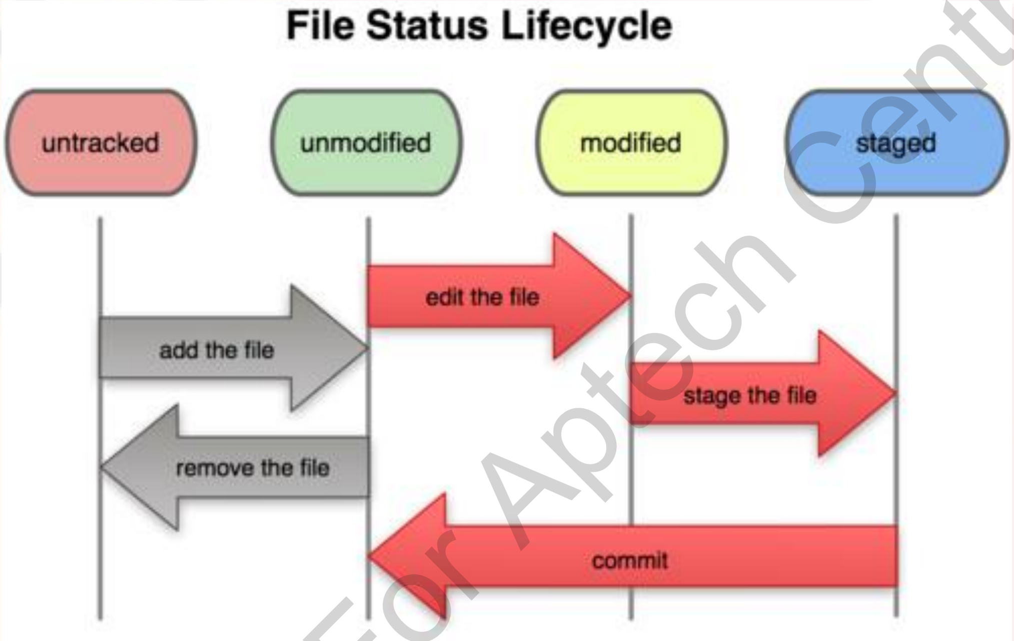
Approaches to Versions

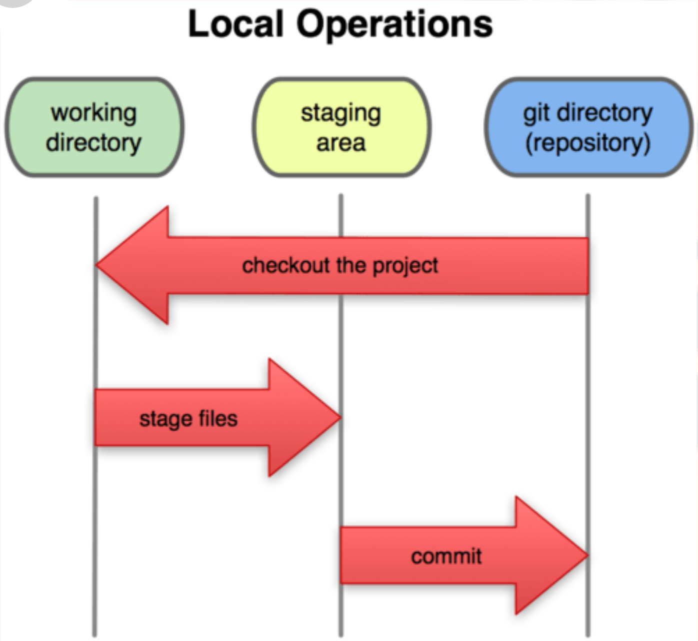
Focus on Locality and Integrity

States and Sections in Git

Git Repositories

- **States** - A user's work in Git iterates over three states
- **Sections** - A Git project works in three main sections





BASICS OF GIT 5-5

Branching in Git

Approaches to Versions

Focus on Locality and Integrity

States and Sections in Git

Git Repositories

- Git repositories are not binary files, unlike most databases. Instead, a Git repository is a directory that contains a set of files and subdirectories within it

Standard GIT Repository

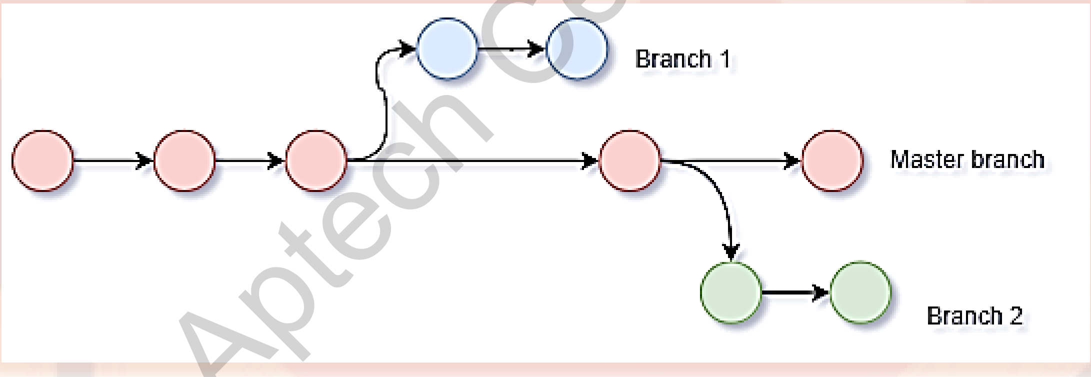
A standard Git repository is linked to a copy of the working tree.

Bare Repository

A bare repository is just a copy of the repository itself and is not linked to a copy of the working tree.

BENEFITS OF GIT BRANCHING MODEL

- Easy Experimentations
- Independent exploration of ideas
- Trying out other approaches
- Preservation of the main file

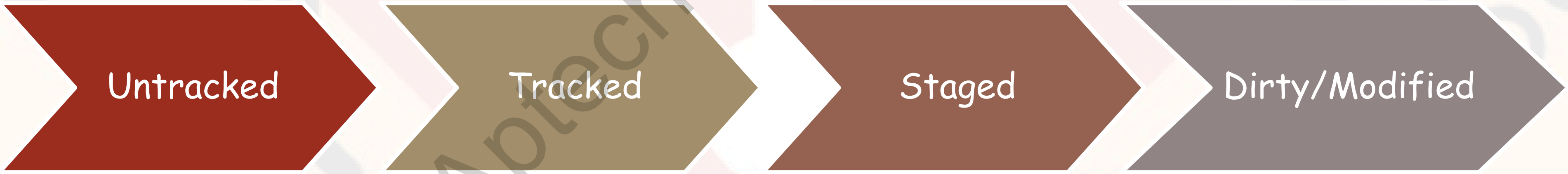


ADVANTAGES OF GIT

- Free to download
- Faster operations
- Requires less run-time
- Easy compression of data
- Committed data remains secure
- High security
- Does not require a powerful hardware

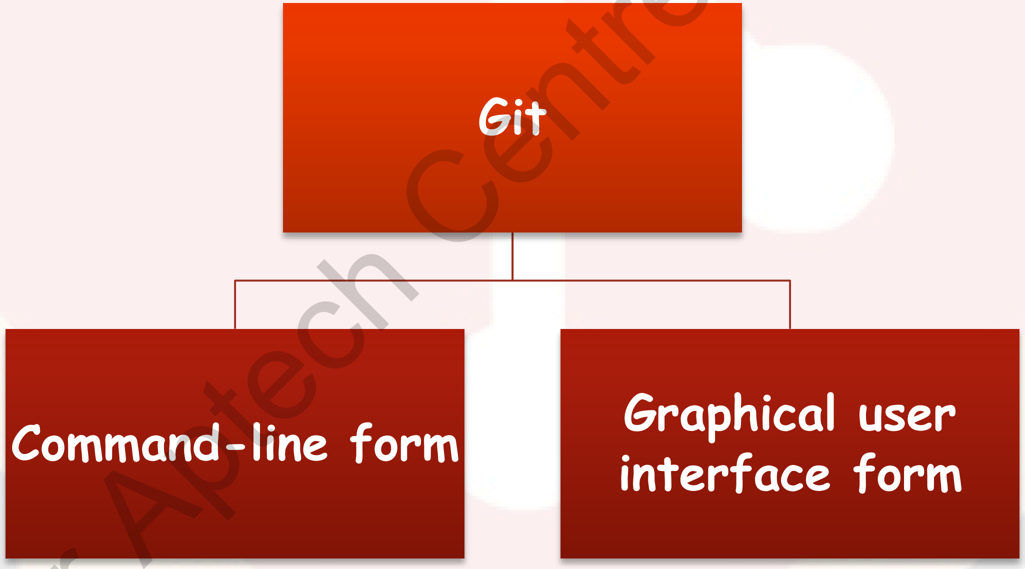
STATES OF GIT

- A file in Git can also go through four different states:
  - Untracked
  - Tracked
  - Staged
  - Dirty/Modified


Untracked
Tracked
Staged
Dirty/Modified

COMMAND-LINE PROGRAM

- Two forms of Git
  - ○ Command-line
  - ○ Graphical user interface


Git

Command-line form

Graphical user interface form

SETTING UP GIT

- Git can be set up in a few simple and easy steps

SUMMARY

- Version control is a necessity for large-scale and complex projects.
- Git is the most popular method of version control, because of its distributed nature, speed, safety, and integrity.
- Git has several advantages over traditional version control systems, due to its localized approach to control.
- Git can be used both from the command line and graphical interfaces.
- Installation and setup of Git on a Windows machine can be done via a series of steps.