PLURALSIGHT

Git
Version Control Strategy

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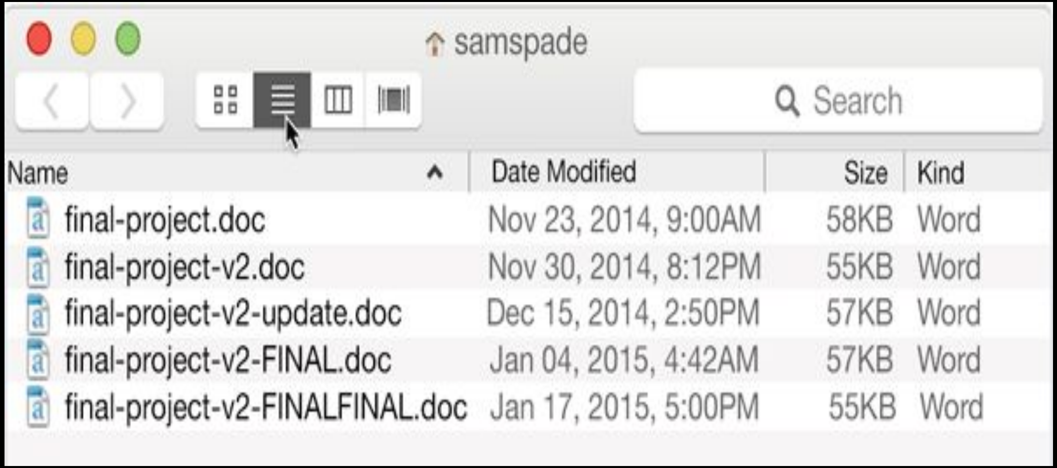
Use Case

Design a version control strategy using Git? Describe your approach for branching, merging, and handling different releases.

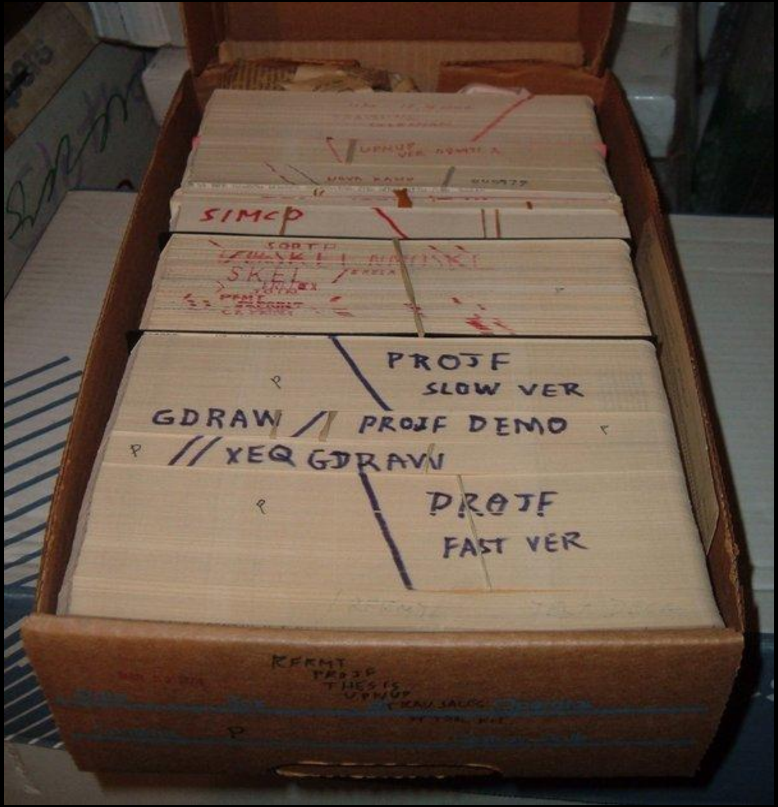
Version Control Strategy

- A systematic approach to managing code changes.
- Helps teams collaborate efficiently.
- Maintains project stability and history.

How Project are managed before version control



Name	Date Modified	Size	Kind
final-project.doc	Nov 23, 2014, 9:00AM	58KB	Word
final-project-v2.doc	Nov 30, 2014, 8:12PM	55KB	Word
final-project-v2-update.doc	Dec 15, 2014, 2:50PM	57KB	Word
final-project-v2-FINAL.doc	Jan 04, 2015, 4:42AM	57KB	Word
final-project-v2-FINALFINAL.doc	Jan 17, 2015, 5:00PM	55KB	Word

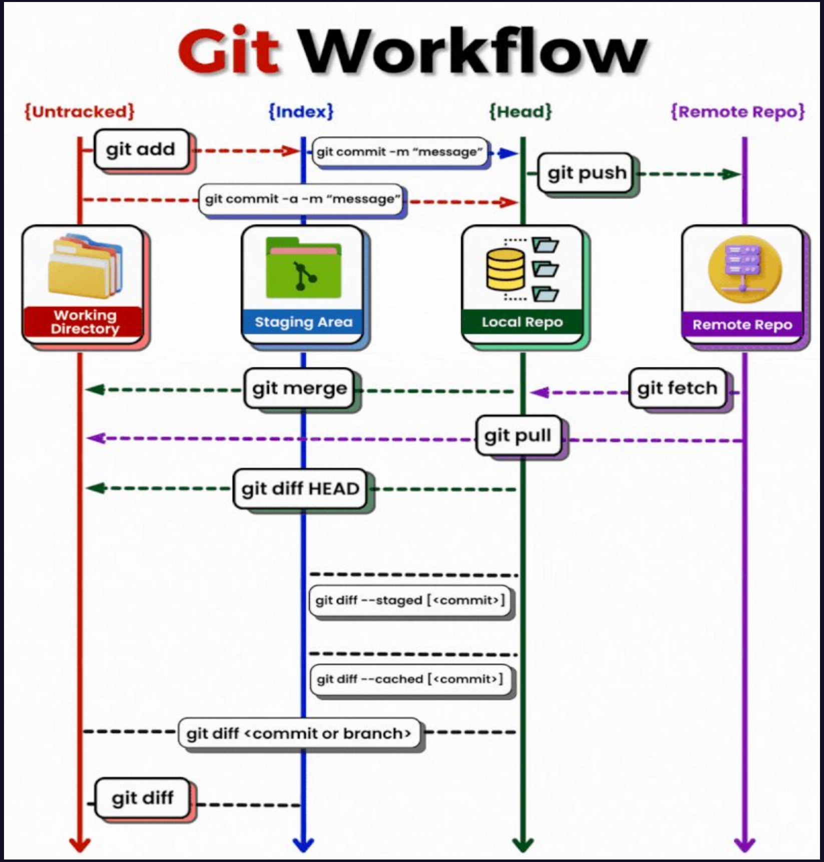


Why It is Important

- No Code Tracking
- No History
- Merge Conflicts
- No Accountability
- Collaboration Issues

Git Workflow

- Modify files in your working directory.
- Stage files, adding snapshots of them to your staging area.
- Commit changes to the Local Repository with git commit.
- Sync changes with the Remote Repository using git push.

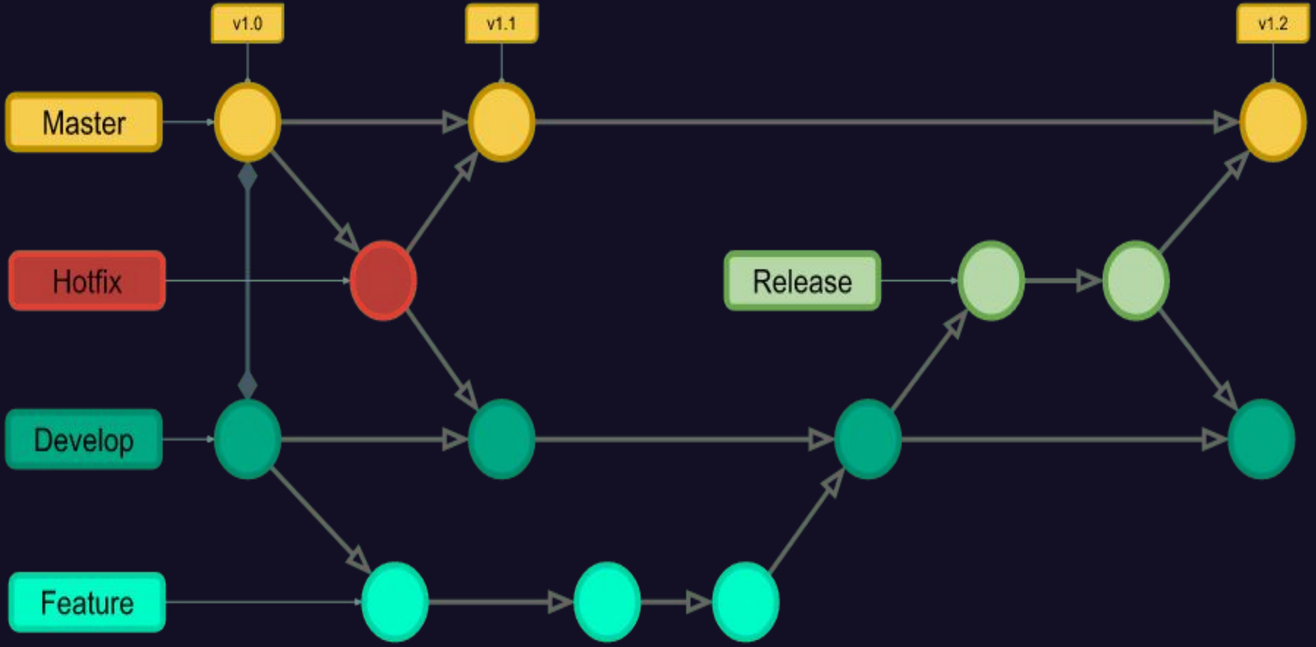


Branching Strategy

A branching strategy defines how branches are used to manage code development and collaboration in a Git repository.

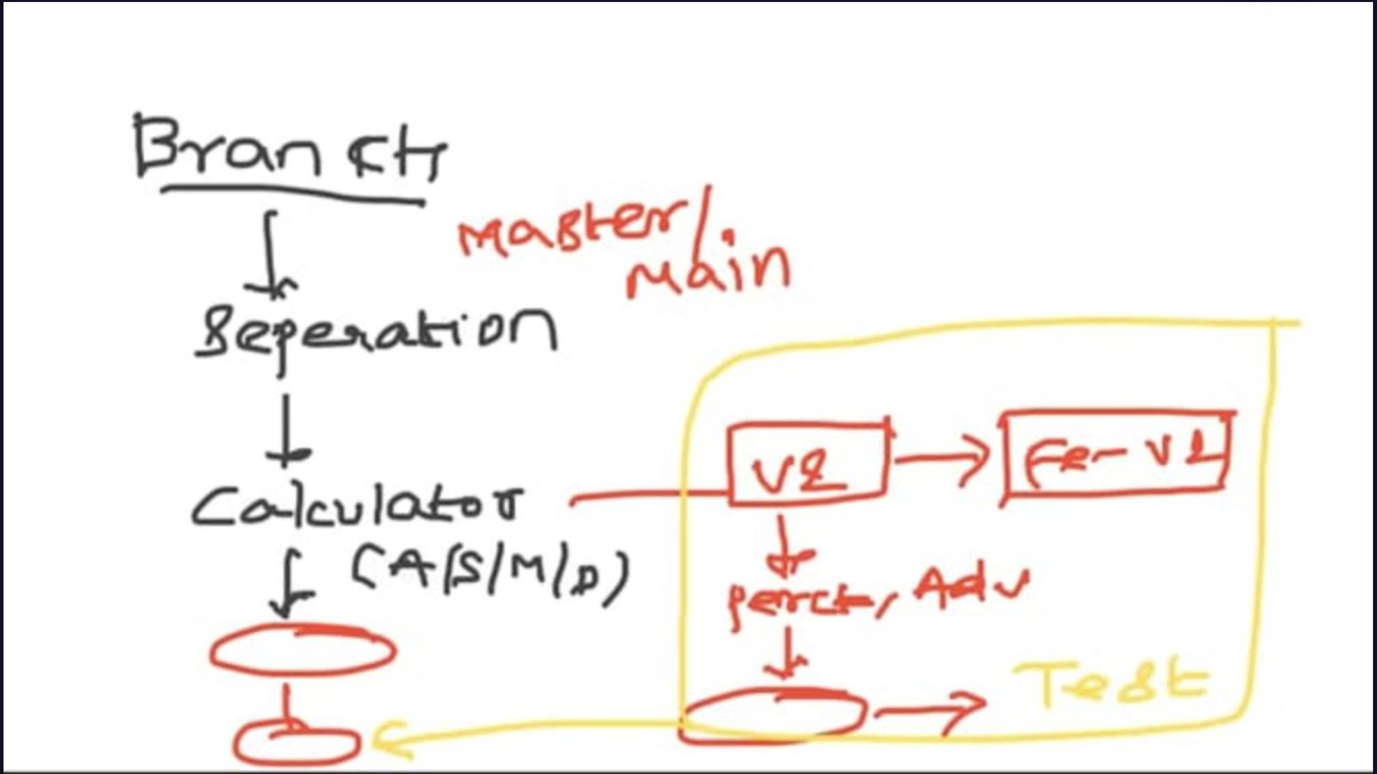
Common Git Branches:

- Main/Master
- Develop
- Feature Branch
- Release Branch
- Hotfix Branch



Example

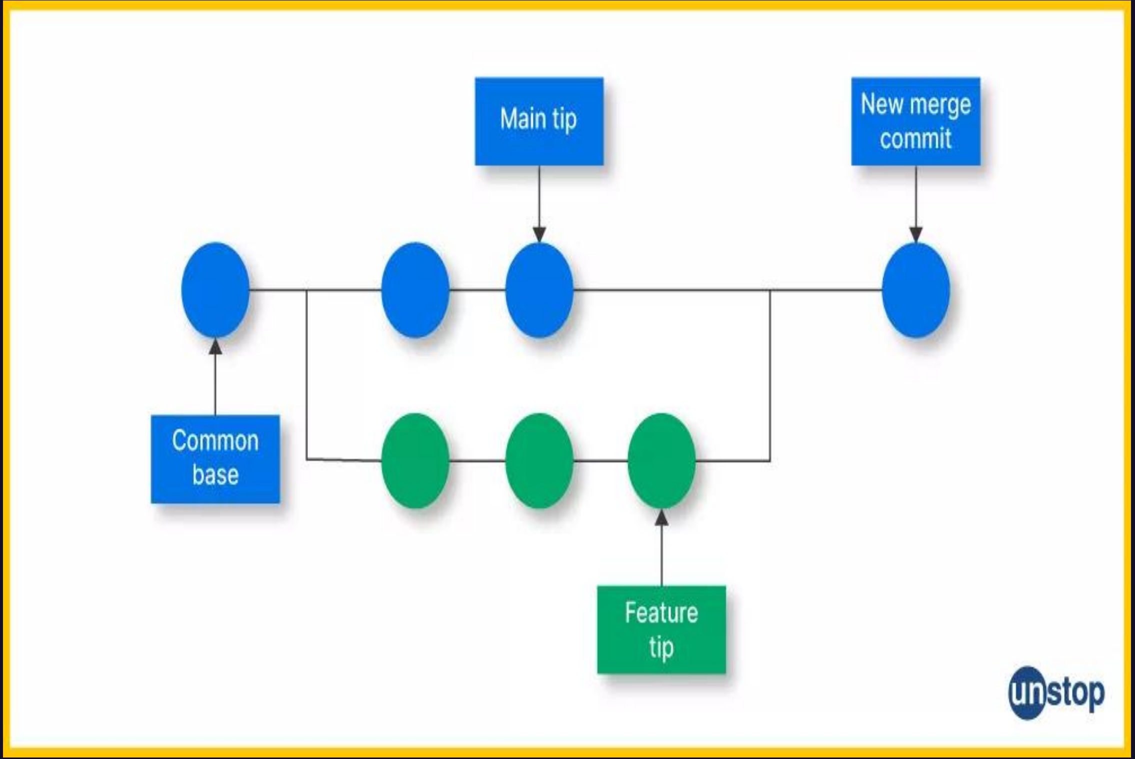
Branches - Master, Develop, Feature, Release, Hotfix



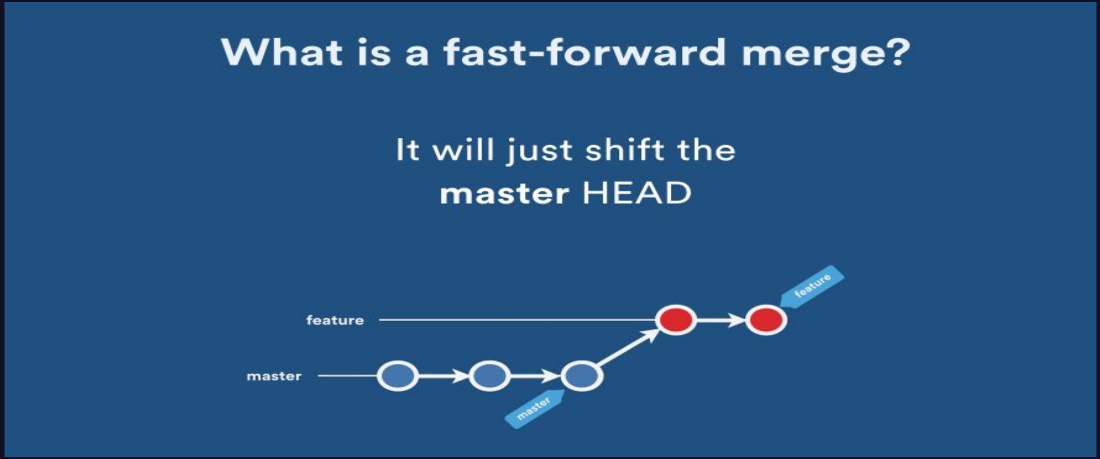
Merging Strategies

Various ways of merging in Git

- Fast Forward
- Squash
- Rebase and merge
- Three way merge



Fast Forward Merge

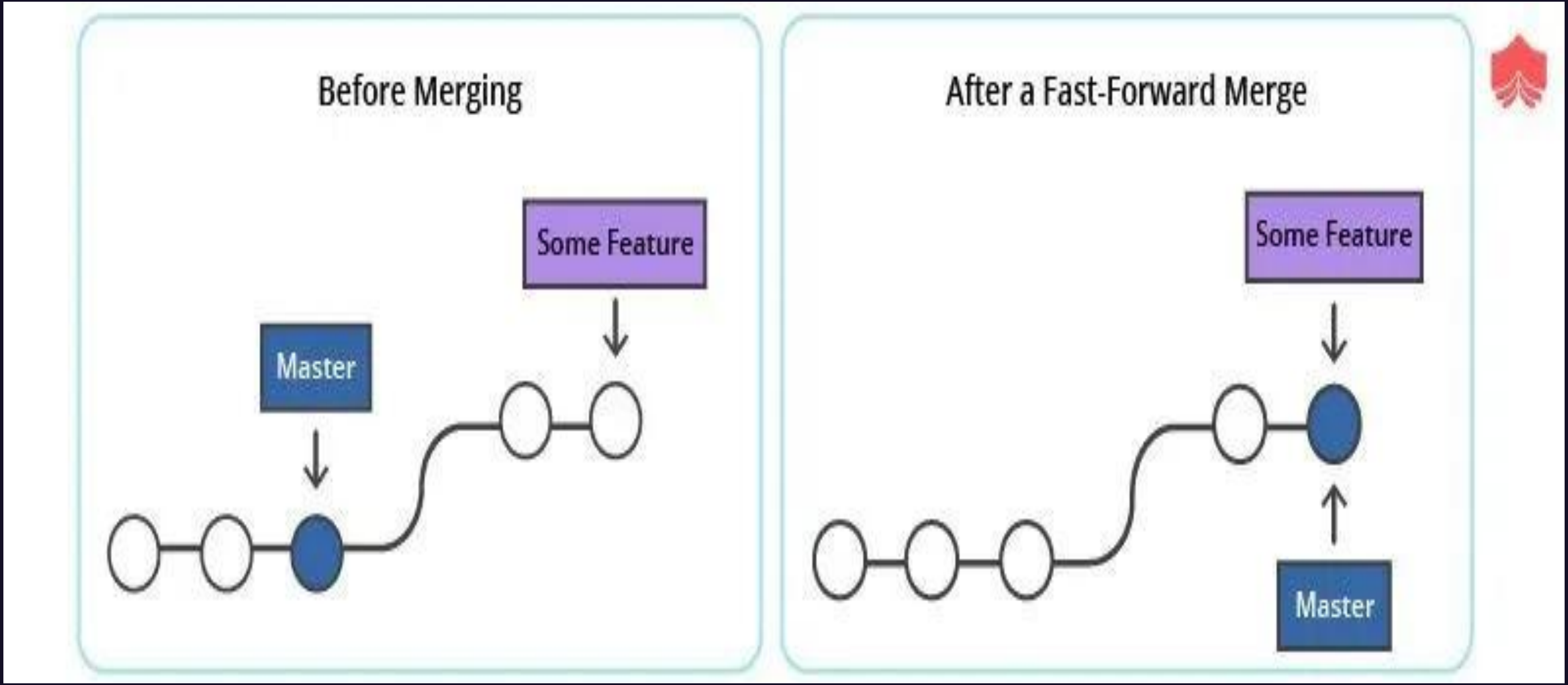

What is a fast-forward merge?
It will just shift the master HEAD
feature
master
feature
master

Happens when there are no commits on the base branch since the feature branch was created

Simply moves the pointer forward without creating a new commit.

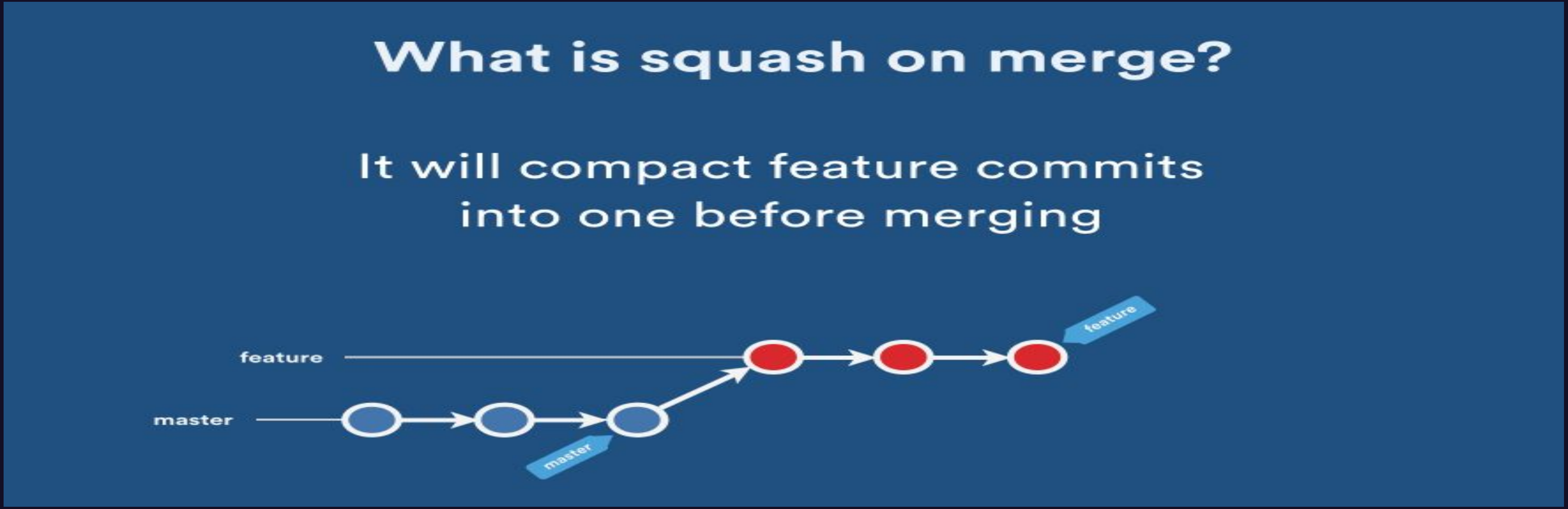
Advantage : It keeps the history clean and linear.

Example Scenario



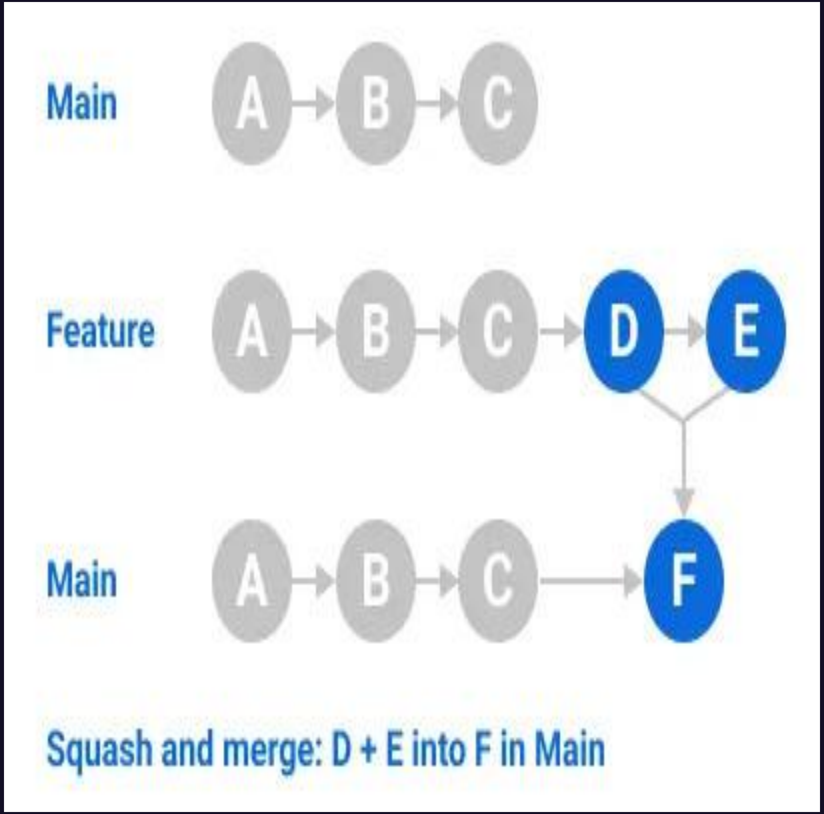
Squash Merge

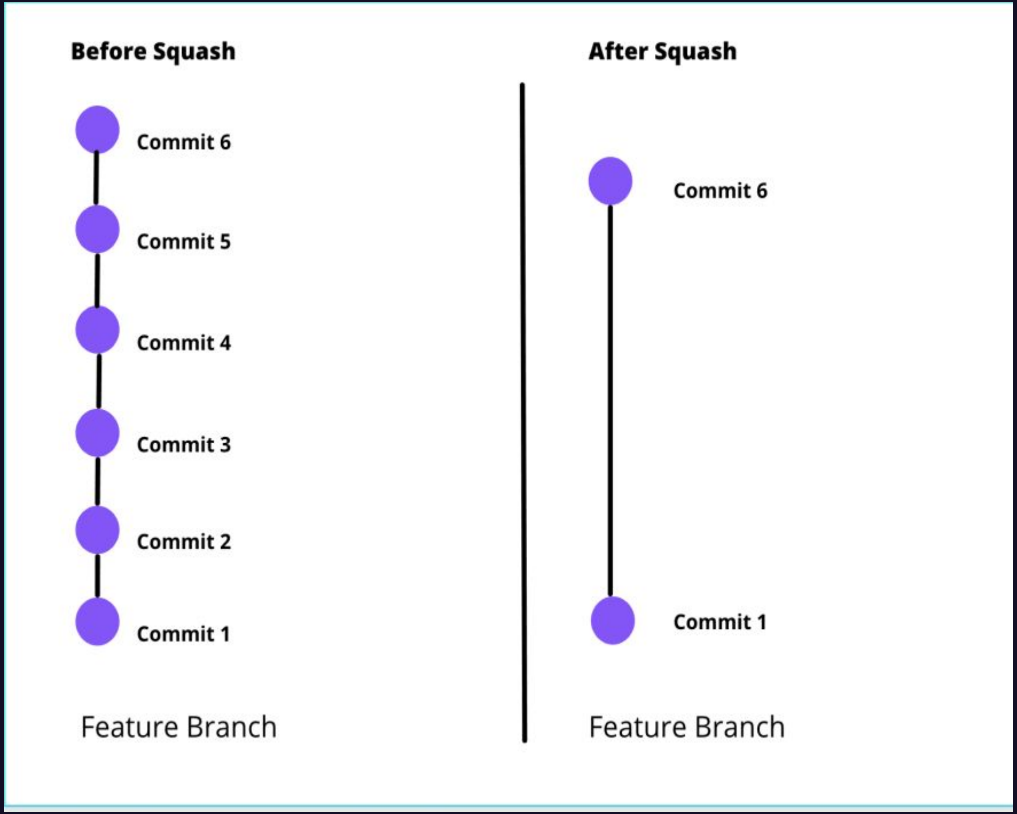
- Combines all changes from a branch into a single commit before merging.
- Useful for keeping commit history clean.


What is squash on merge?

It will compact feature commits into one before merging

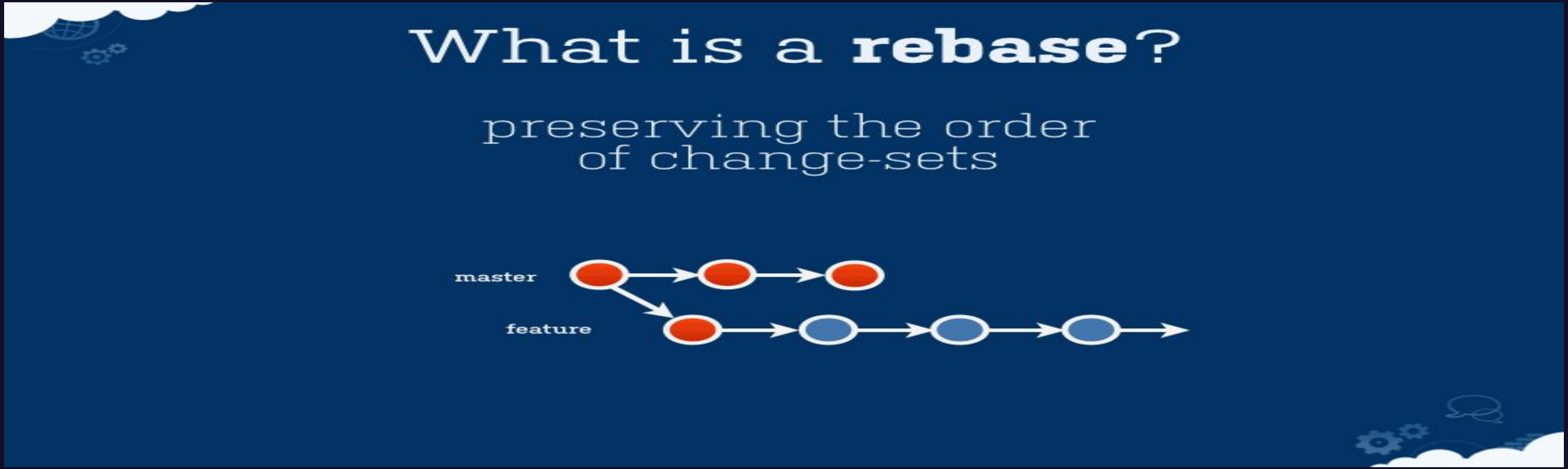
Example Scenario



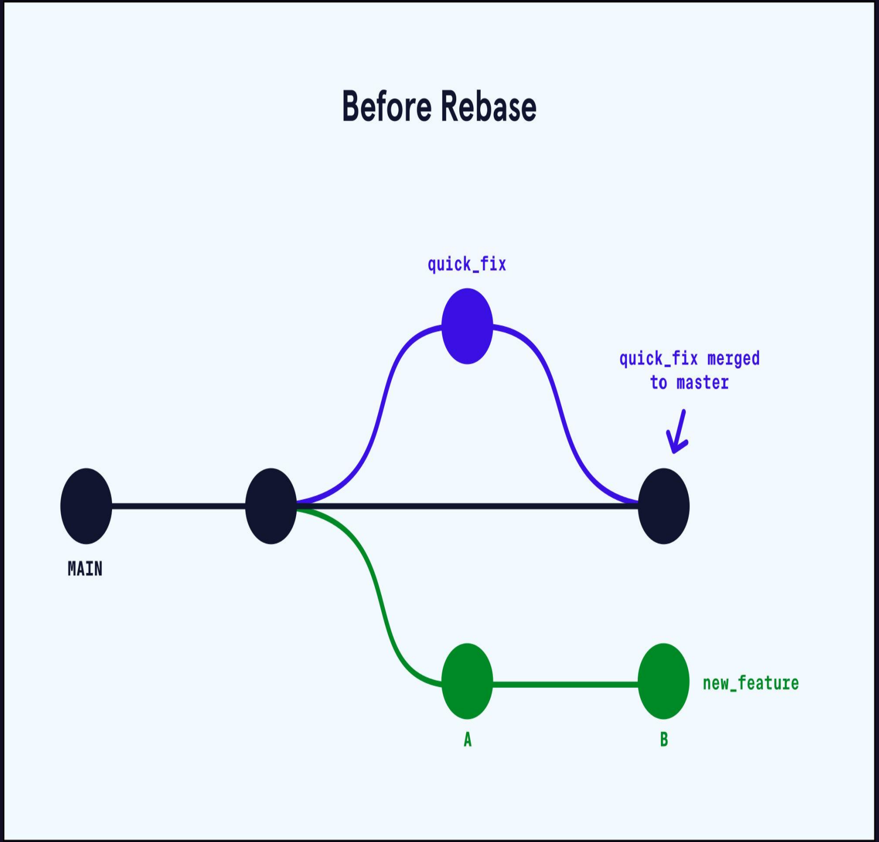


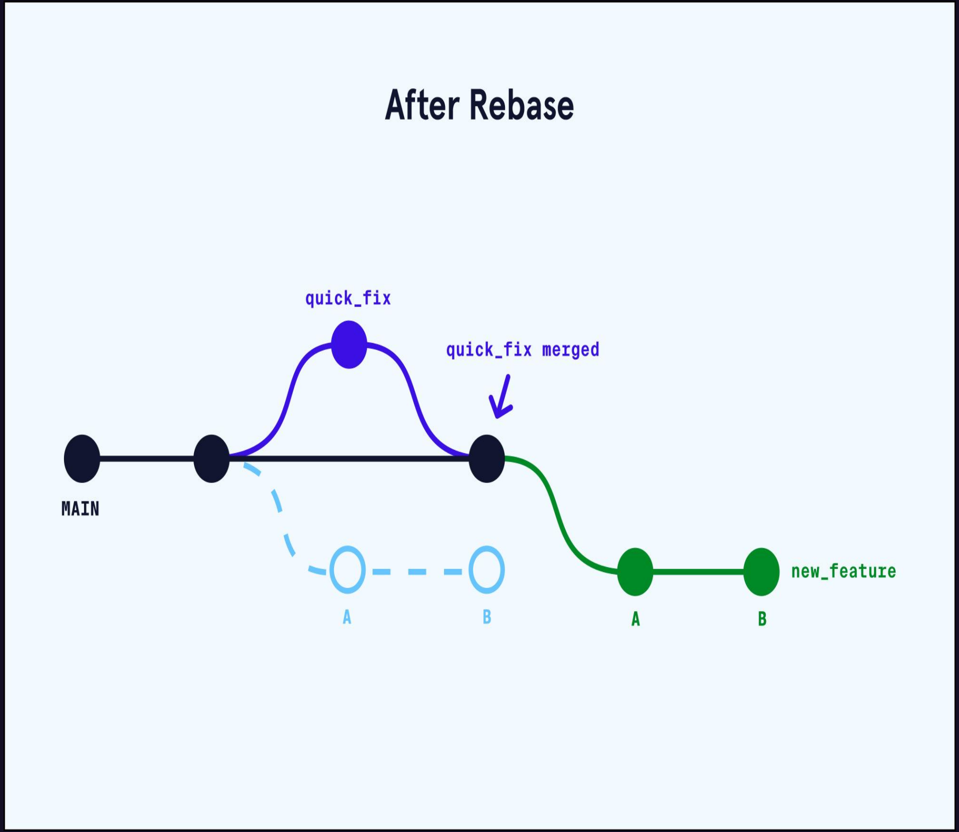
Rebase and Merge

- Replays commits from one branch onto another, then merges.
- Avoids merge commits and maintains a linear history.



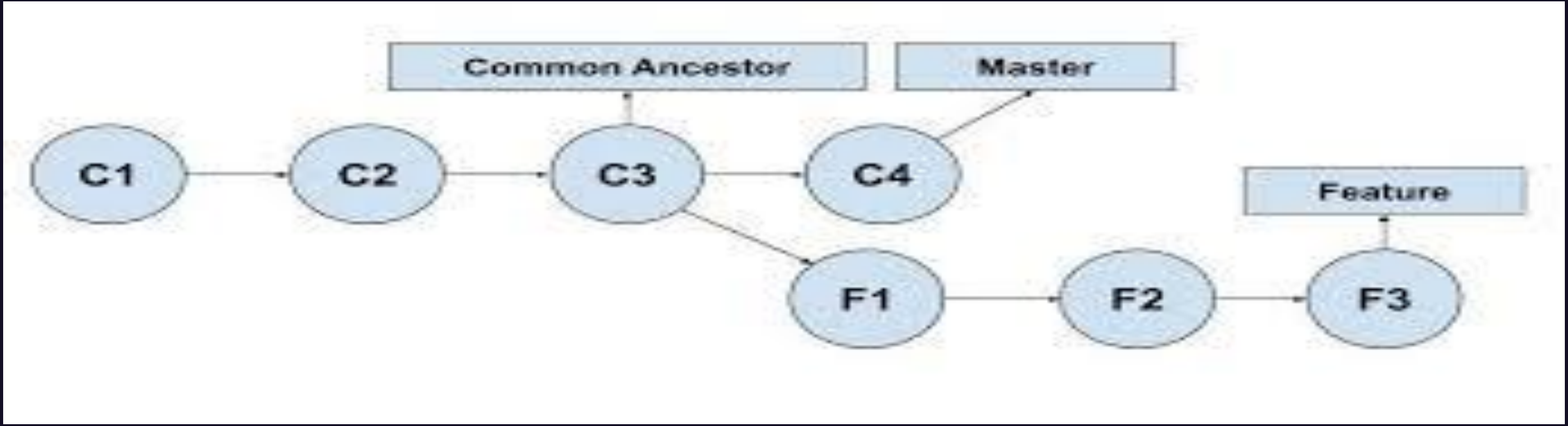
Example Scenario



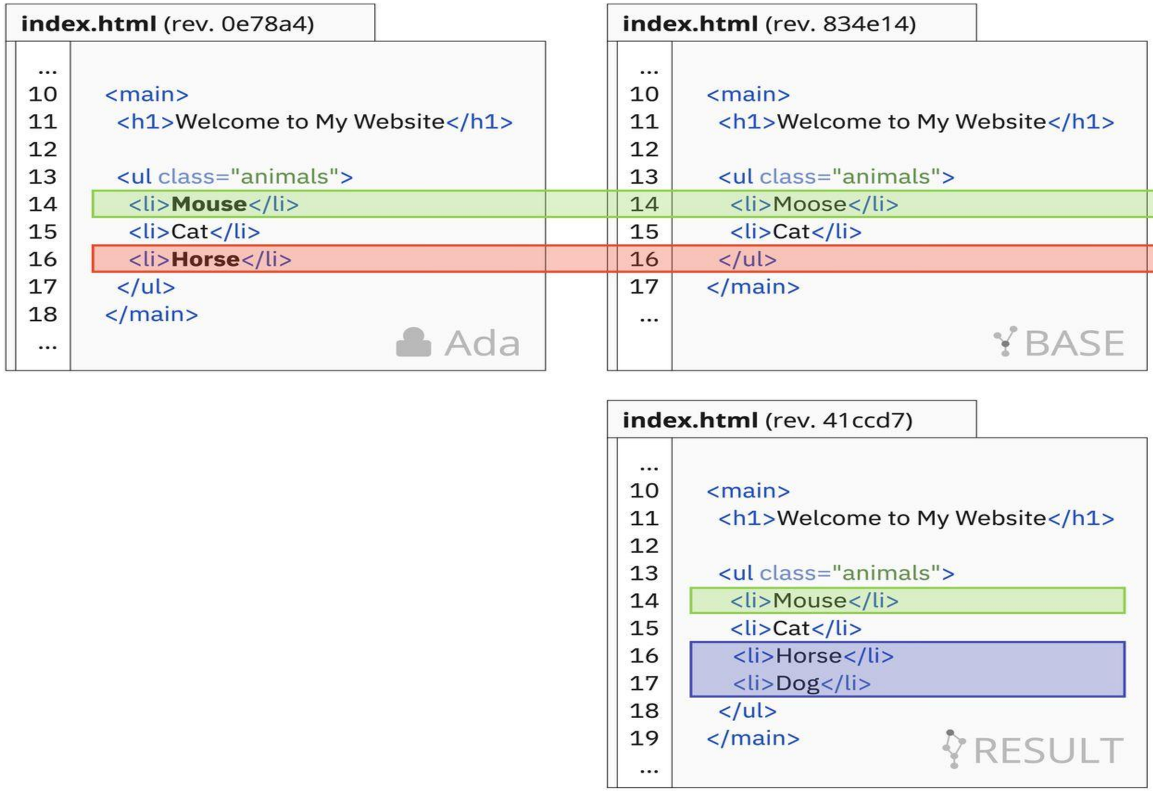


Three way Merge

- **Three-Way Merge** combines changes from two branches.
- Compares both branches to a **common ancestor** (version of the main branch from when you originally created the feature branch).
- **Resolves conflicts** if the same code is changed in both branches.



Example Scenario



index.html (rev. 0e78a4)

```
...
<main>
 <h1>Welcome to My Website</h1>

 <ul class="animals">
  <li>Mouse</li>
  <li>Cat</li>
  <li>Horse</li>
 </ul>
</main>
...
```

Ada

index.html (rev. 834e14)

```
...
<main>
 <h1>Welcome to My Website</h1>

 <ul class="animals">
  <li>Moose</li>
  <li>Cat</li>
 </ul>
</main>
...
```

BASE

index.html (rev. 4b3bc6)

```
...
<main>
 <h1>Welcome to My Website</h1>

 <ul class="animals">
  <li>Moose</li>
  <li>Cat</li>
  <li>Dog</li>
 </ul>
</main>
...
```

Bob

index.html (rev. 41ccd7)

```
...
<main>
 <h1>Welcome to My Website</h1>

 <ul class="animals">
  <li>Mouse</li>
  <li>Cat</li>
  <li>Horse</li>
  <li>Dog</li>
 </ul>
</main>
...
```

RESULT

CONFLICT RESOLUTION

✓ ***Automatic*** — keep Ada, no changes from Bob

⚠ ***Manual*** — keep both, Ada and Bob made changes

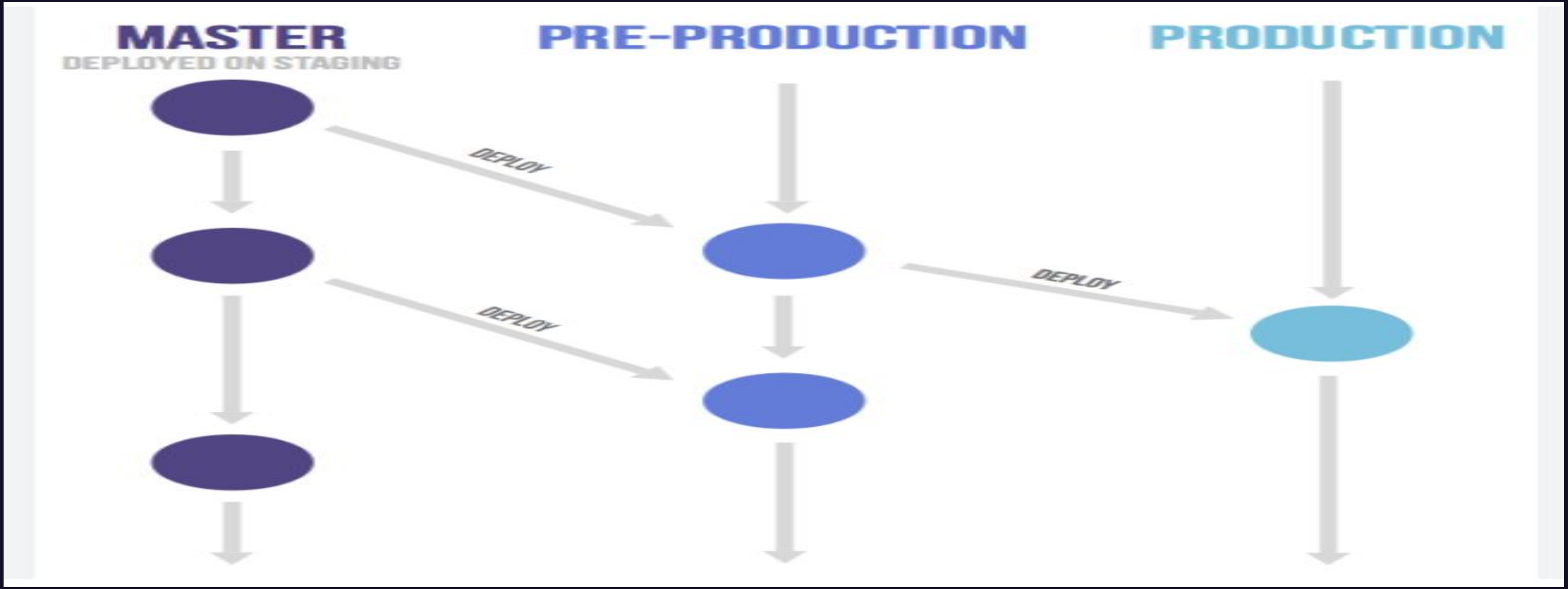
@Stjaertfena | git-init.com

Release Approaches

- GitLab Flow
- Trunk-Based Development
- Git Flow

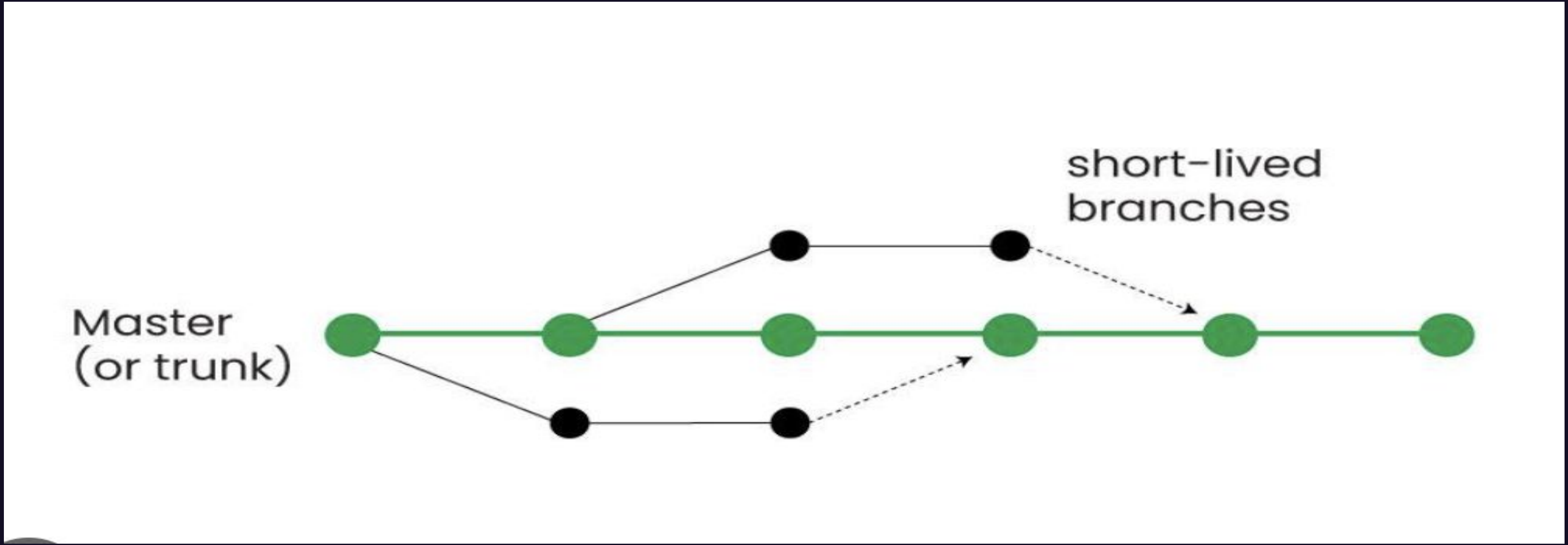
Gitlab Flow Approach

Branches - Master,Pre-production,Production.



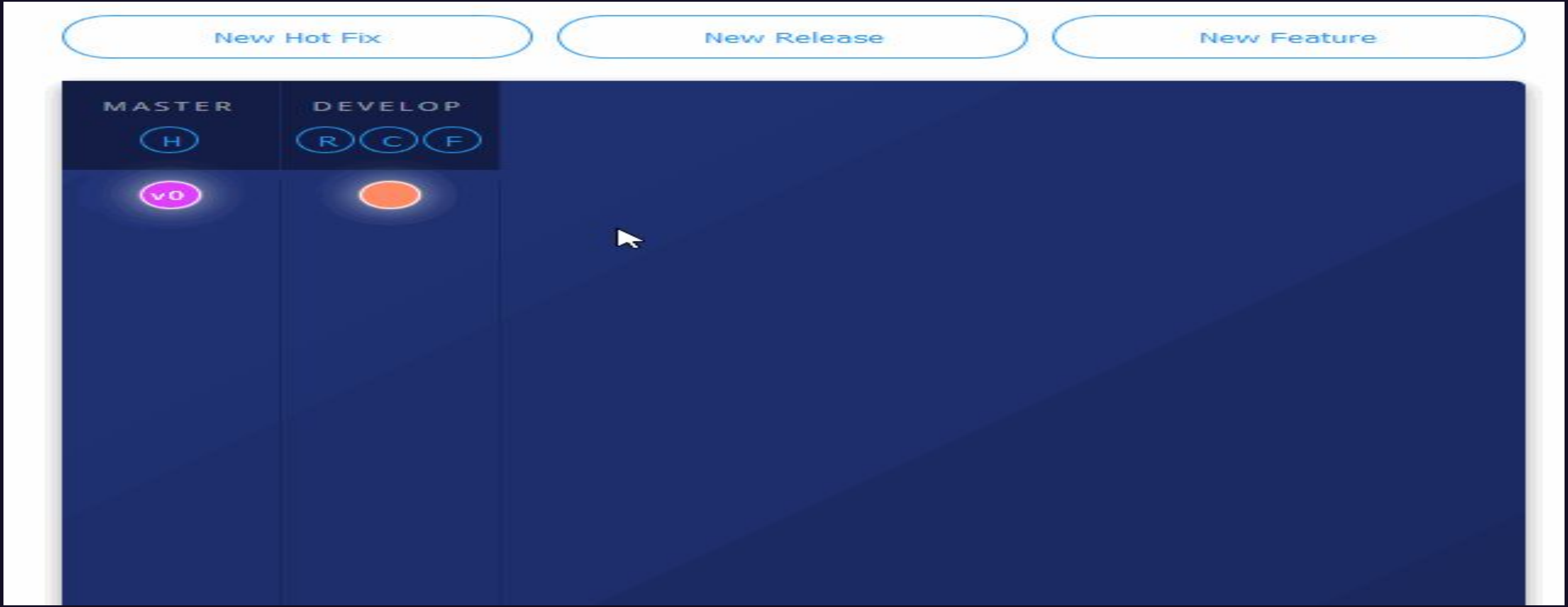
Trunk-Based Approach

Branches - Single main branch (trunk).

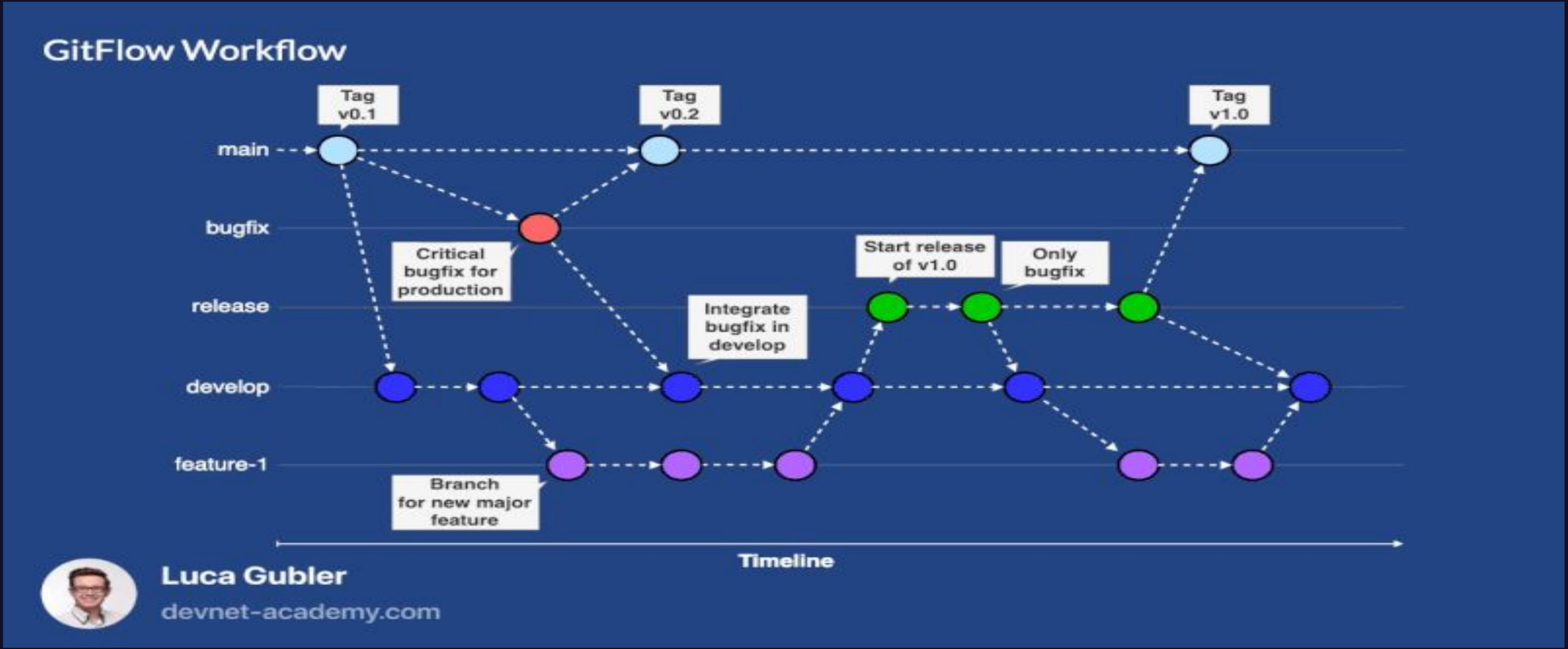


Git Flow Approach

Branches - Master, Develop, Feature, Release, Hotfix

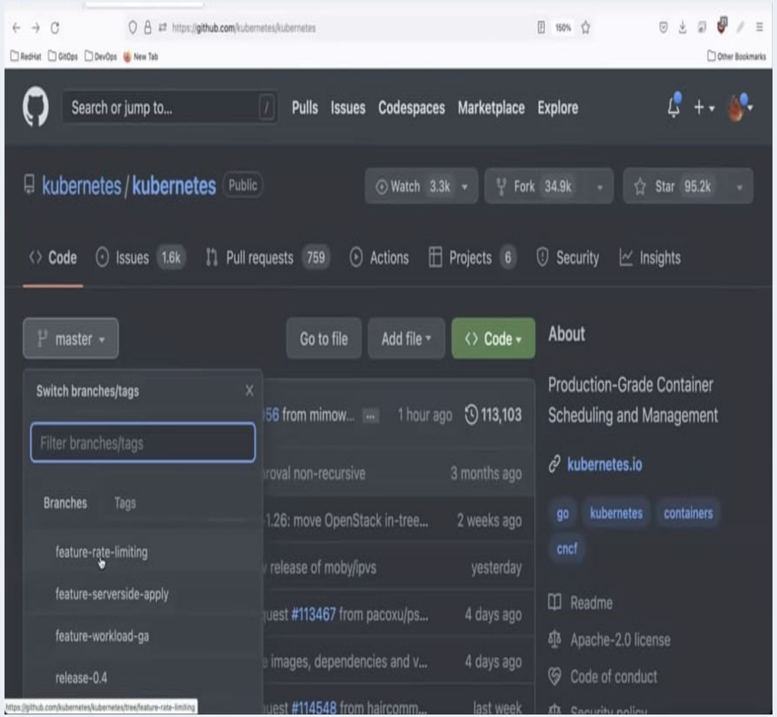


Best Approach



Example - Git Flow

Branches - Master, Develop, Feature, Release, Hotfix



https://github.com/kubernetes/kubernetes

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Switch branches/tags

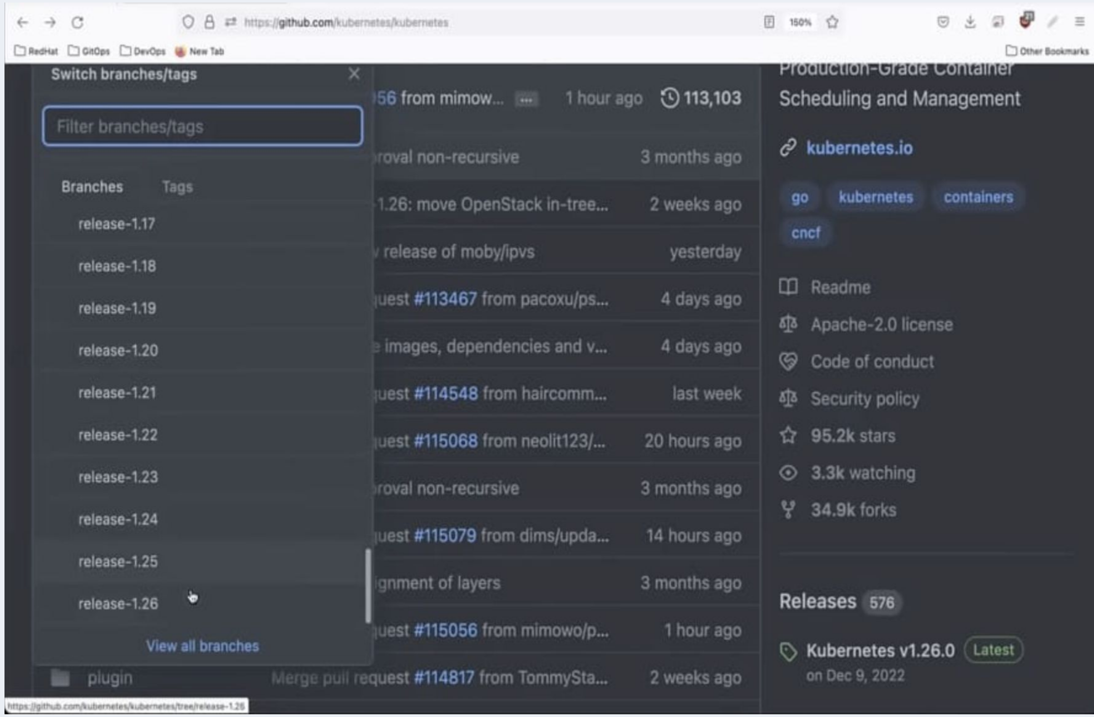
Filter branches/tags

Branches Tags

- feature-rate-limiting
- feature-serverside-apply
- feature-workload-ga
- release-0.4

56 from mimow...	1 hour ago 113,103
roval non-recursive	3 months ago
1.26: move OpenStack in-tree...	2 weeks ago
release of moby/ipvs	yesterday
uest #113467 from pacoxu/ps...	4 days ago
images, dependencies and v...	4 days ago
uest #114548 from haircomm...	last week

https://github.com/kubernetes/kubernetes/tree/feature-rate-limiting



https://github.com/kubernetes/kubernetes

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Switch branches/tags

Filter branches/tags

Branches Tags

- release-1.17
- release-1.18
- release-1.19
- release-1.20
- release-1.21
- release-1.22
- release-1.23
- release-1.24
- release-1.25
- release-1.26

View all branches

56 from mimow...	1 hour ago 113,103
roval non-recursive	3 months ago
1.26: move OpenStack in-tree...	2 weeks ago
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uest #113467 from pacoxu/ps...	4 days ago
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uest #114548 from haircomm...	last week
uest #115068 from neolit123/...	20 hours ago
roval non-recursive	3 months ago
uest #115079 from dims/upda...	14 hours ago
gnment of layers	3 months ago
uest #115056 from mimowo/p...	1 hour ago
plugin Merge pull request #114817 from TommySta...	2 weeks ago

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95.2k stars
3.3k watching
34.9k forks

Releases 576

Kubernetes v1.26.0 Latest on Dec 9, 2022

https://github.com/kubernetes/kubernetes/tree/release-1.26

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Thank You