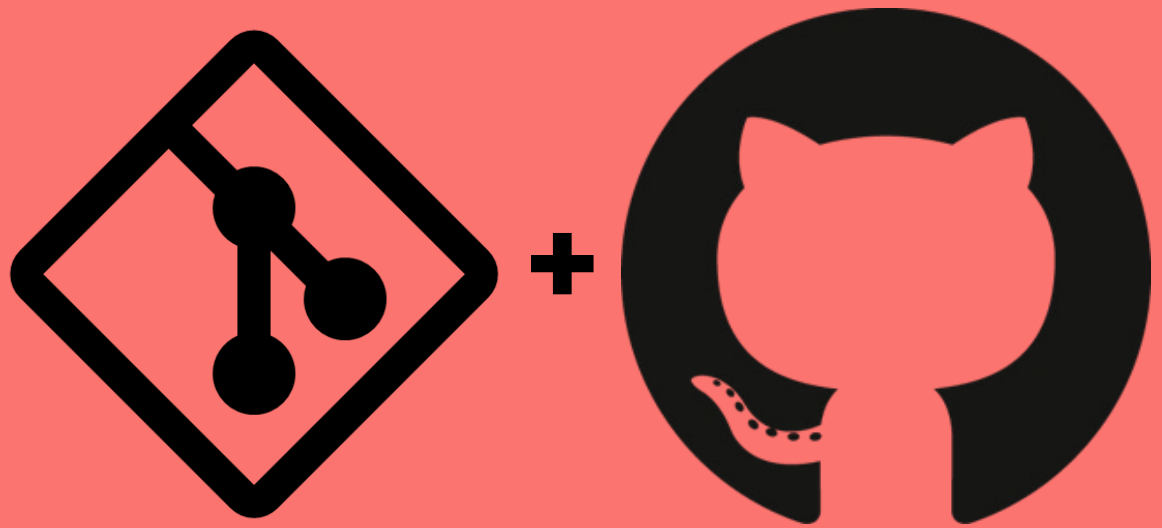
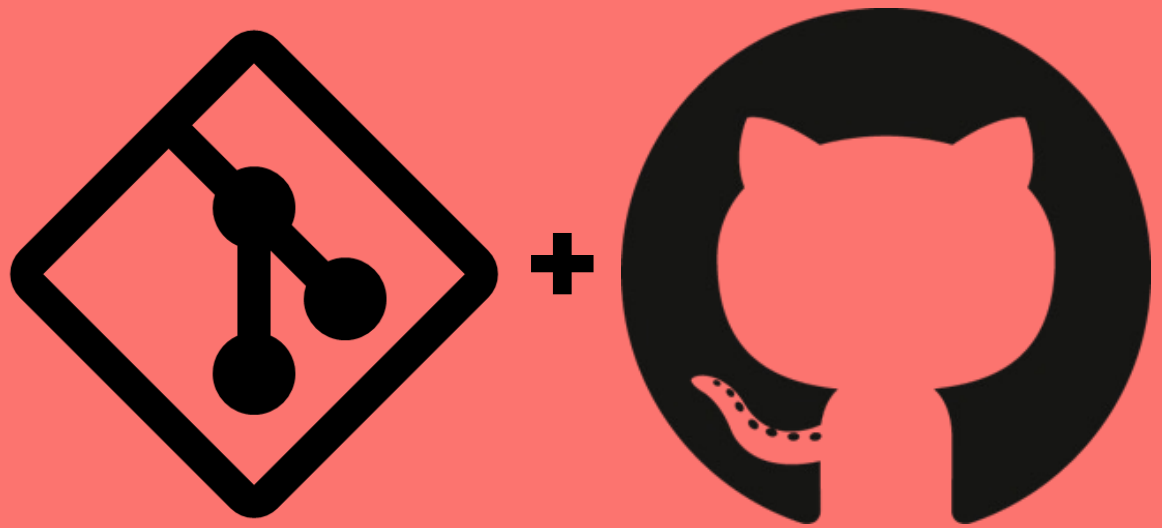
Git

In Practice



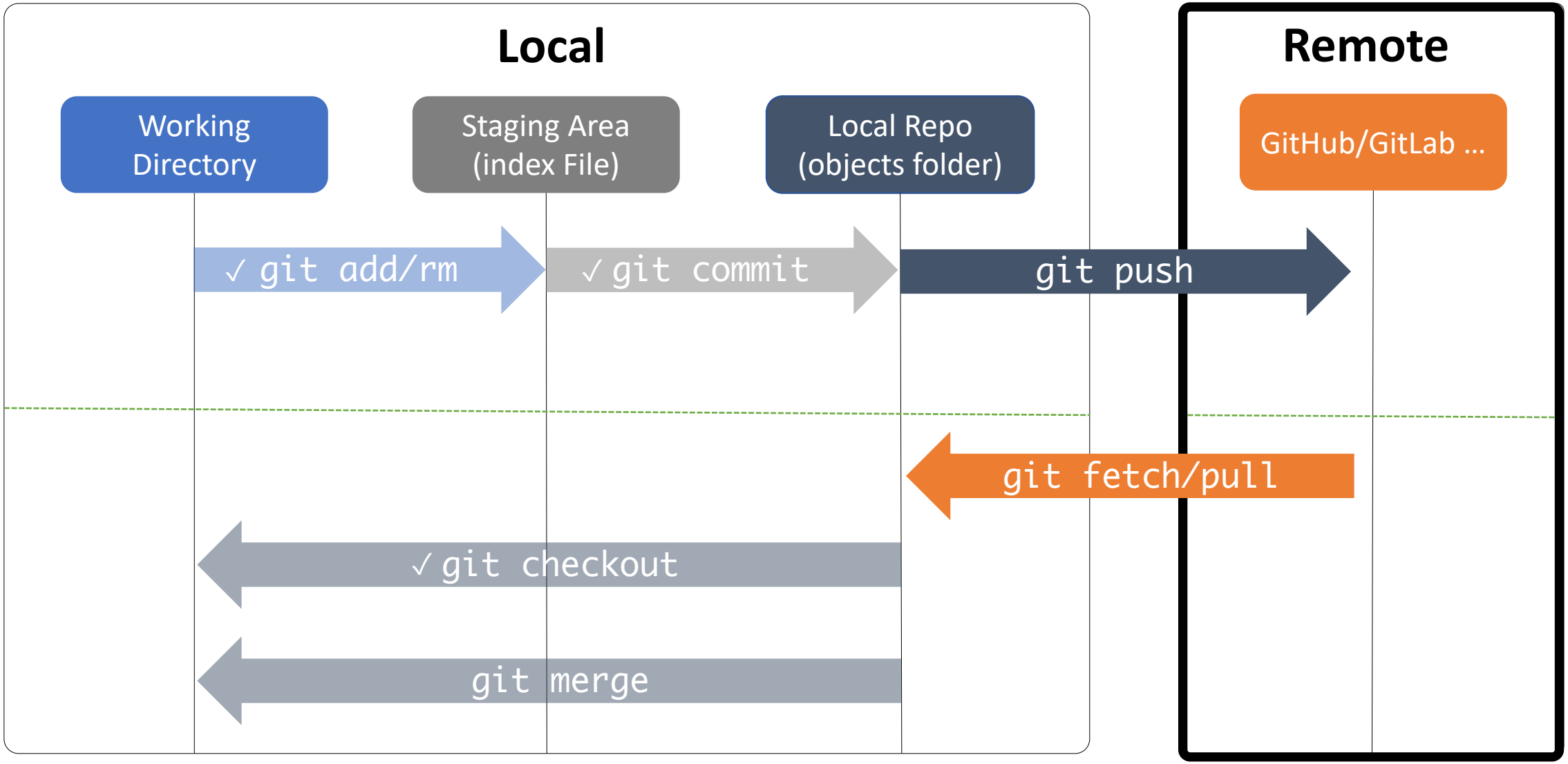
Git

In Practice



1 Remote Repo & Branch Types

The Remote State



Remote Repository

1. A remote repository is a common repository that all team members use to exchange code changes

2. It typically does *not* provide a file tree of the project's current state

3. Since the repository has no working directory it is considered *bare*

Remote Repository

4. A remote repository has the data of the `.git` directory – nothing else

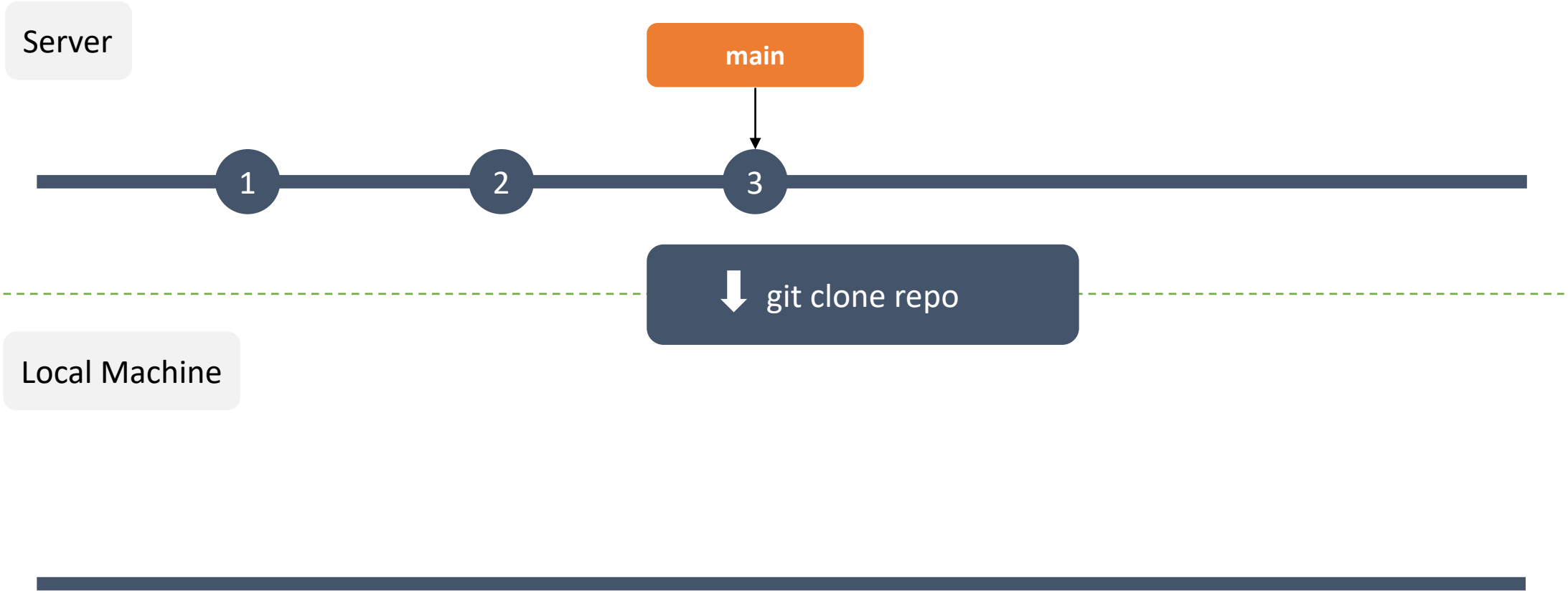
5. With the Git data one can reconstruct the entire folder structure of a working tree

The Protocols

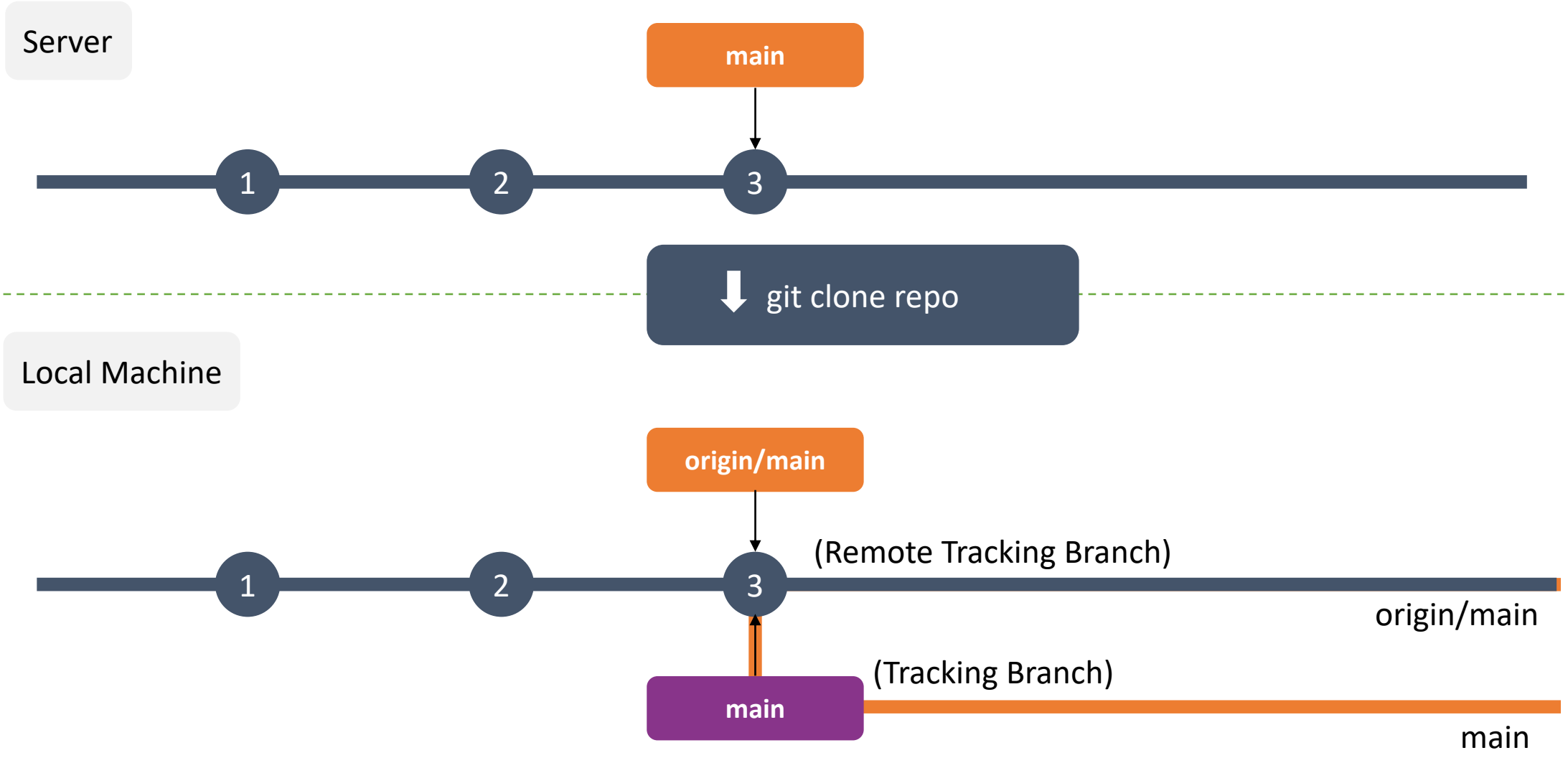
Git can communicate using four types of protocols

1. Local – NFS
2. SSH – commonly used for Github repositories
3. HTTP – uses https and is similar to SSH/Git protocols
    a. Can support basic authentication using username and password
    b. Support for single URL similar to the Git protocol
4. Git – does not have inbuild authentication
    a. Generally paired with SSH or HTTPS

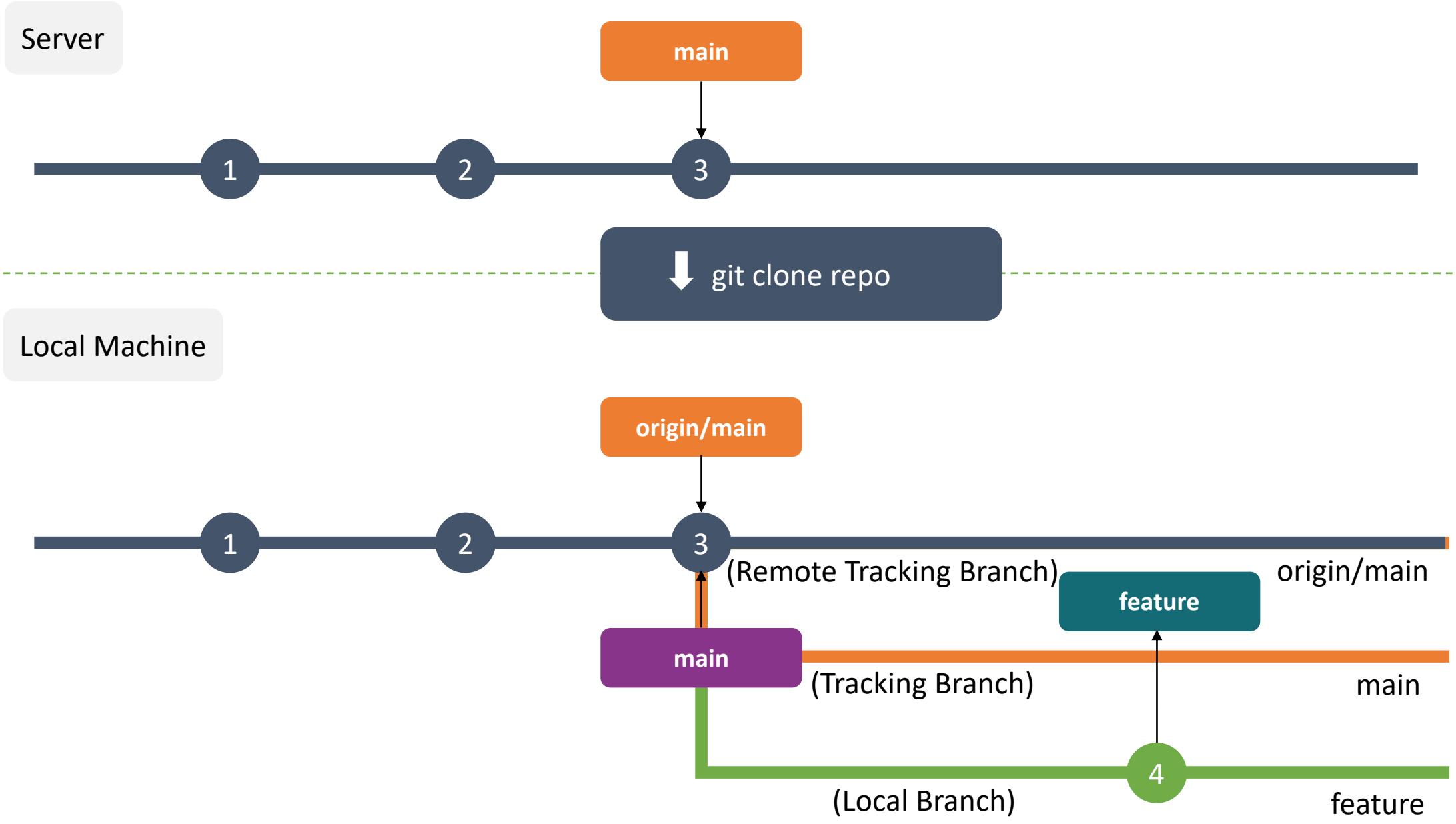
Branch Types



Branch Types



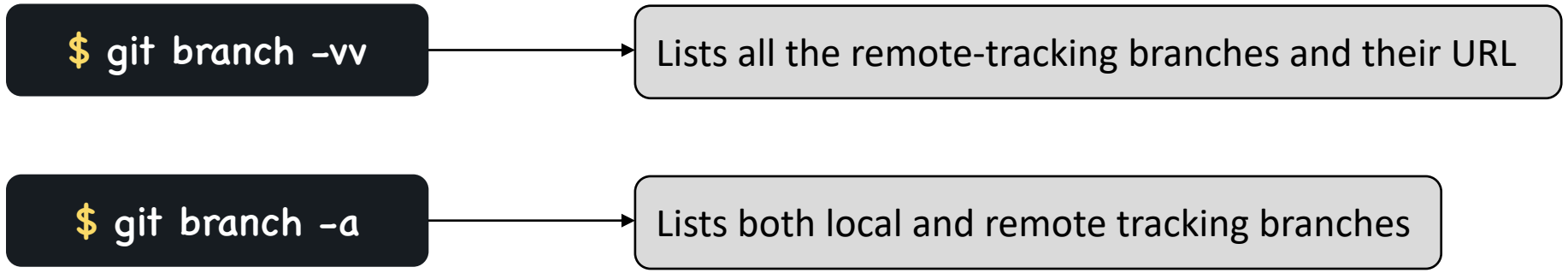
Branch Types



Branch Types – Local Branches

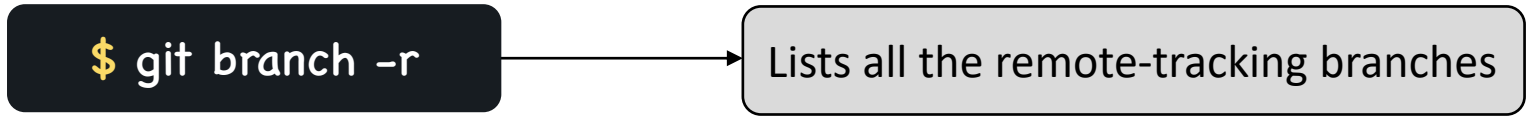
- Local Branches
  - Can be found under `.git/refs/heads/`
  - Tracking local branches – have a remote branch associated together with it

    Tracking branches are local branches that have a direct relationship to a **remote** branch.
  - Non-Tracking local branches – local branches that does not have any association



Branch Types – Remote Tracking Branches

- Can be found under `.git/refs/remotes/<remote>/`
- Local remote branches are remote-tracking branches
- Remote-tracking branches are references to the state of remote branches
- The local references of remote tracking branches cannot be moved
- They’re used to link what you’re working on locally with what’s on the remote
- You cannot switch to or checkout a remote tracking branch



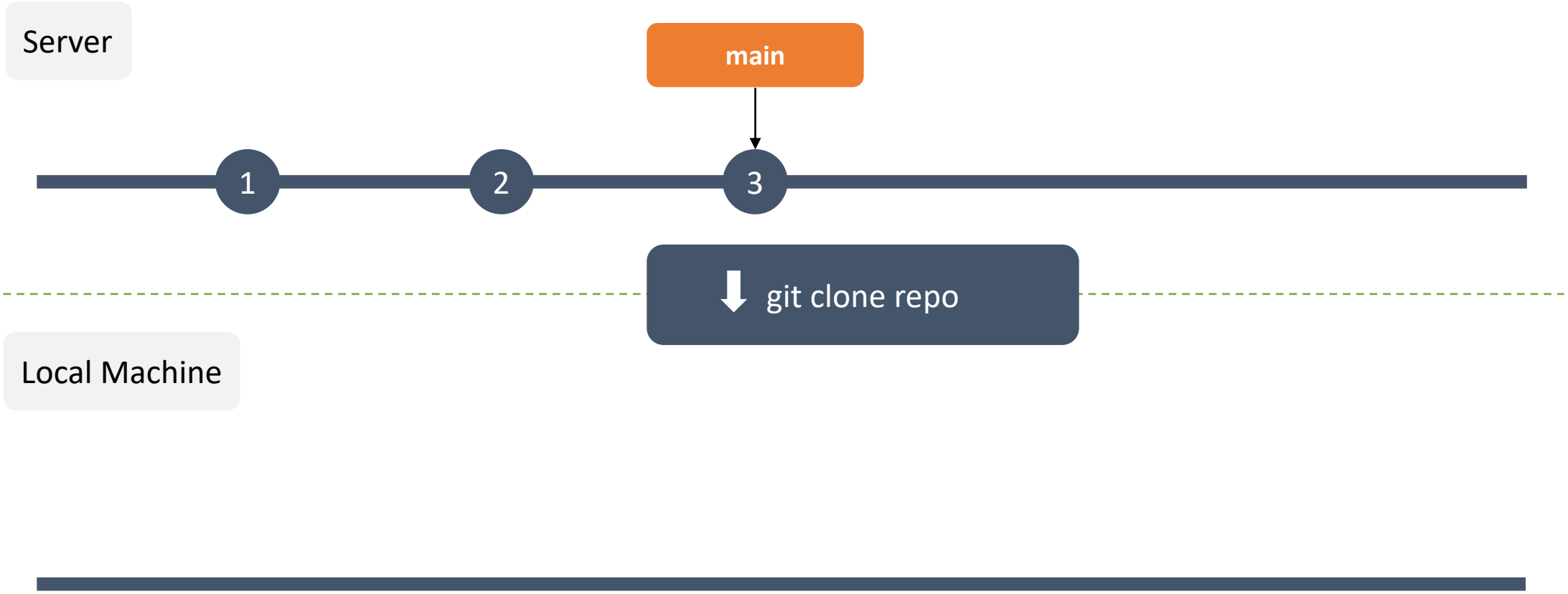
Branch Types – Remote Tracking Branches

- Remote-tracking branch names take the form

  `<remote>/<branch name>` e.g., `origin/main`

- By default, a `git clone` will create origin/master or origin/main
- Once setup, they can automatically `fetch` and `push` changes to the remote branch
- `git status` will recognize how many commits the tracking branch is in front/back of the remote version of the branch

Tracking and Remote Tracking Branches



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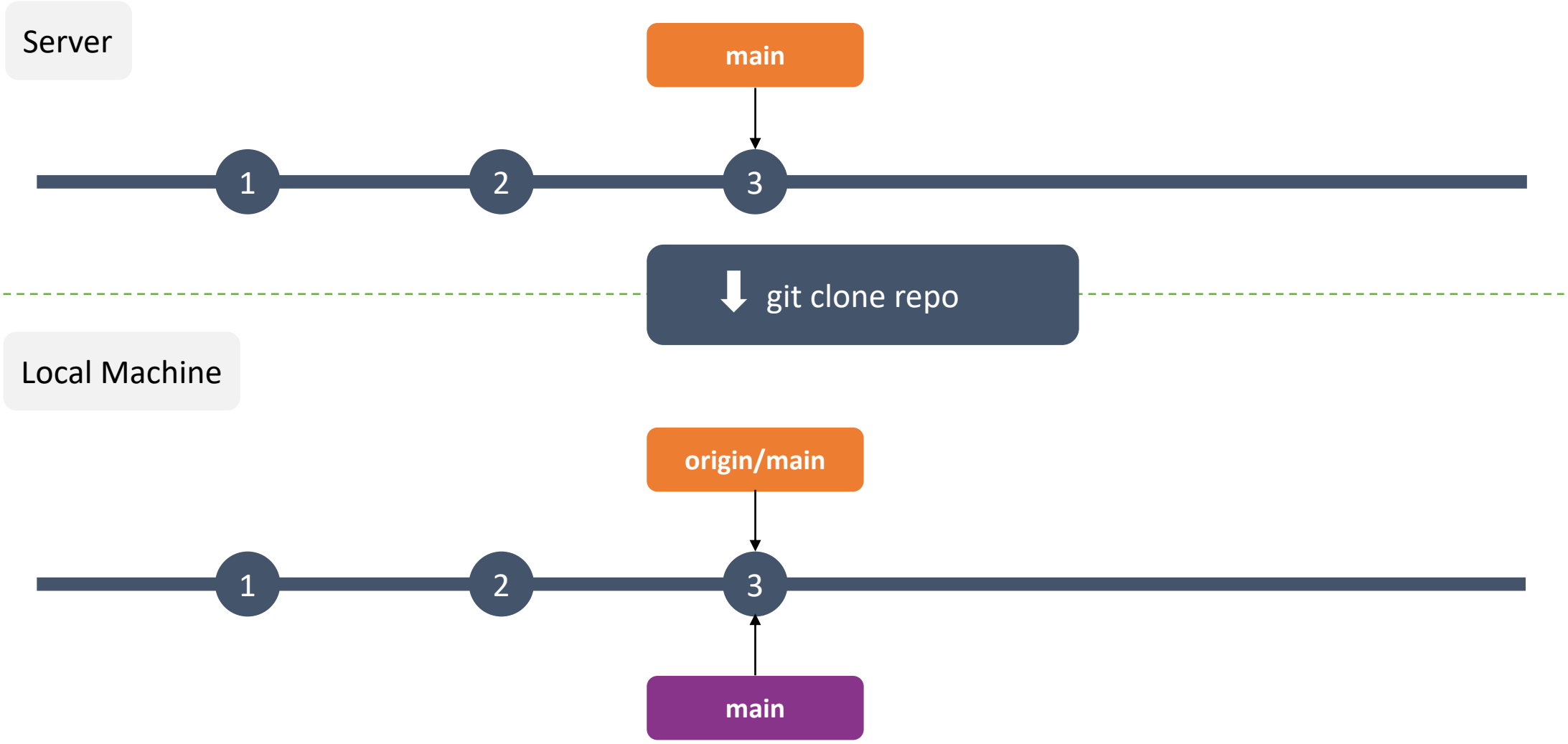

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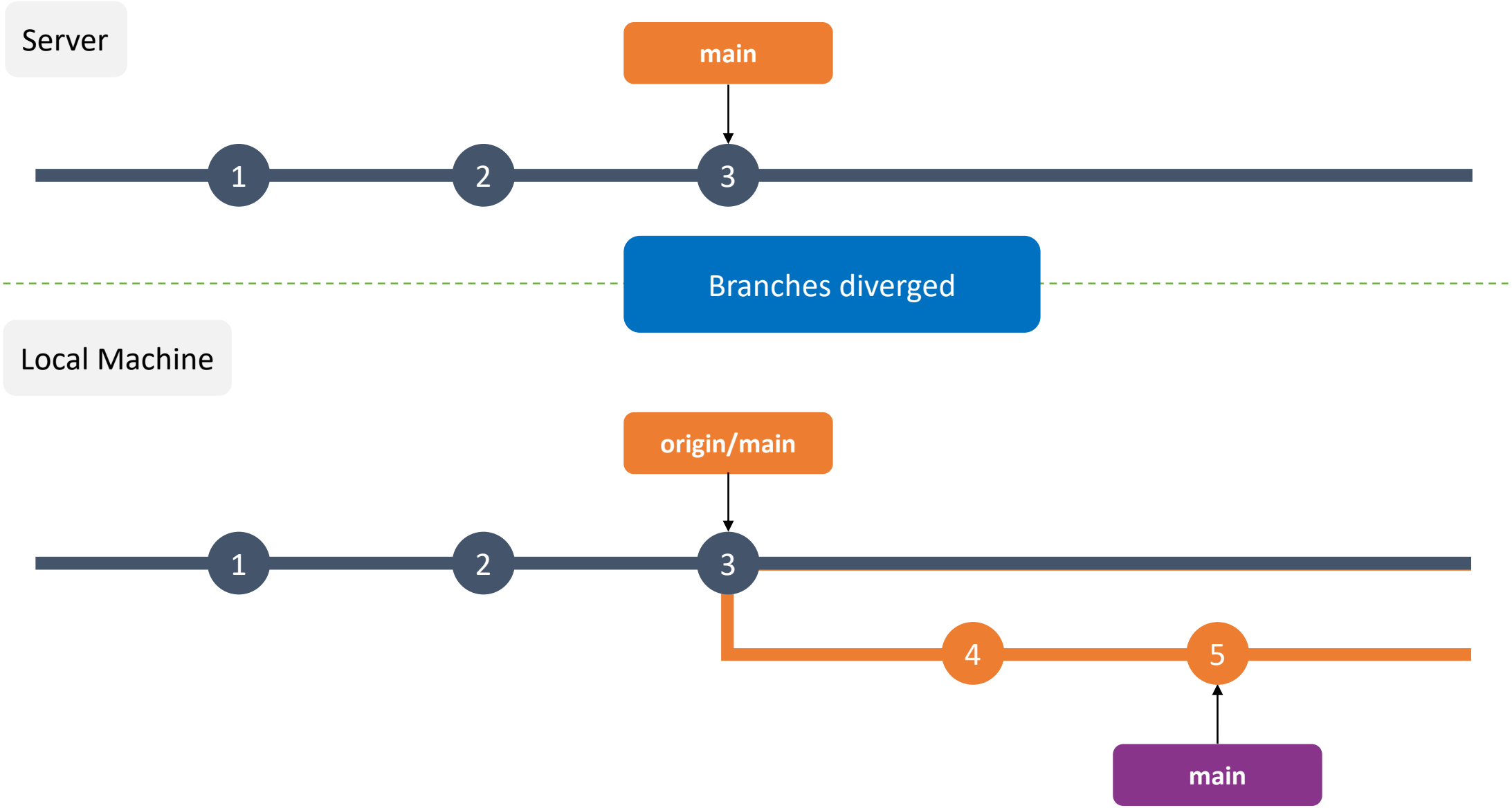

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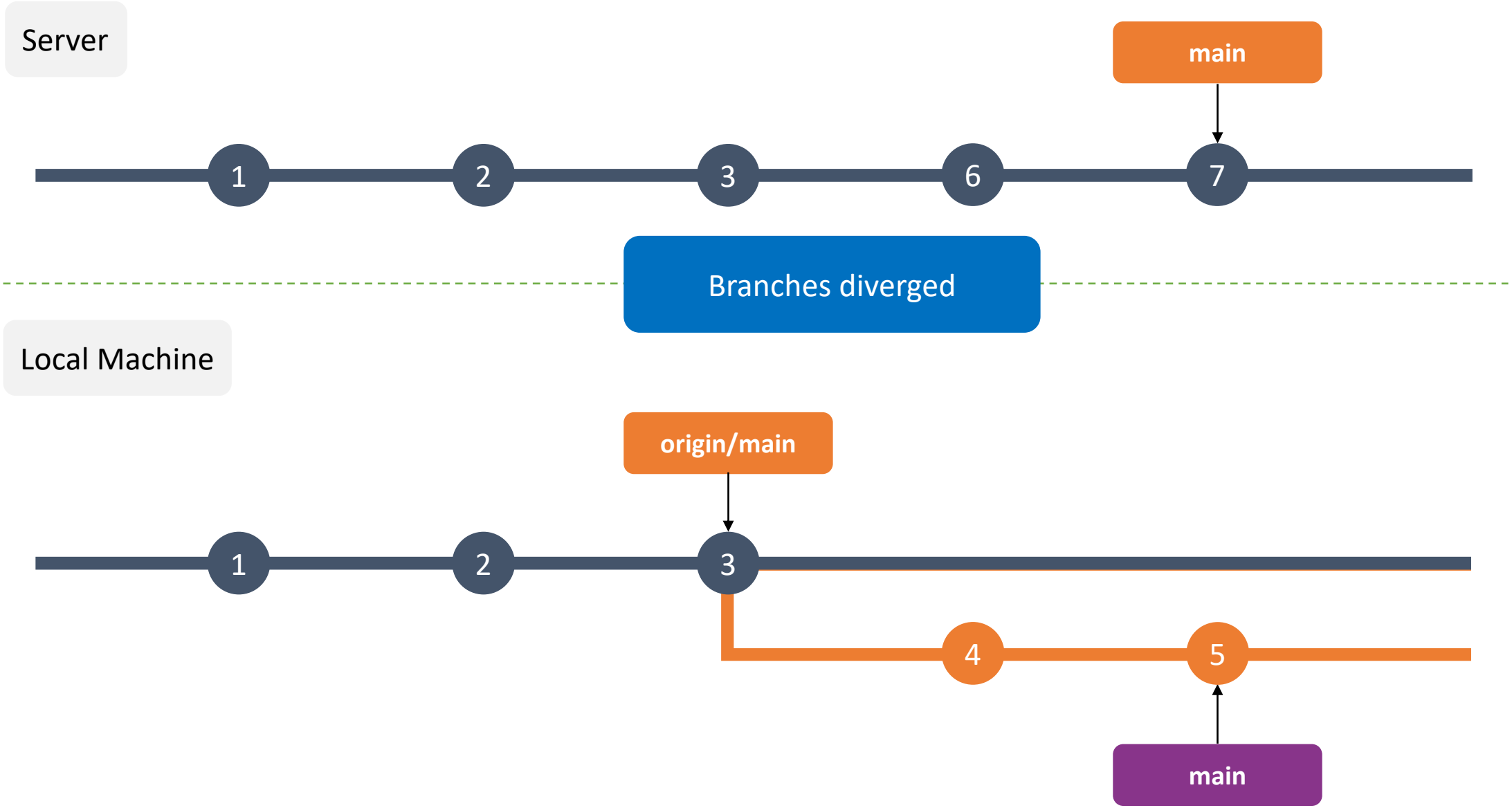

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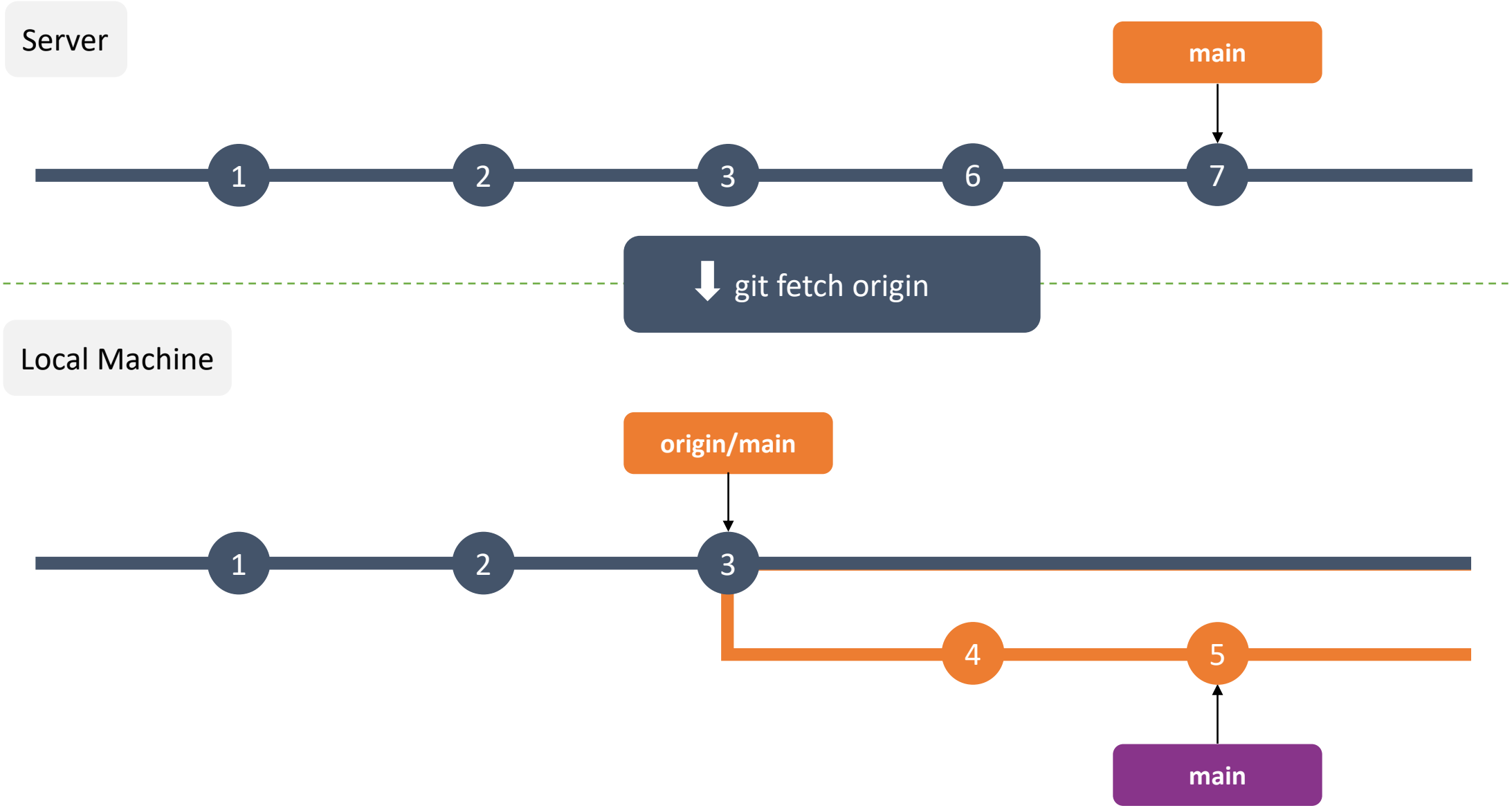

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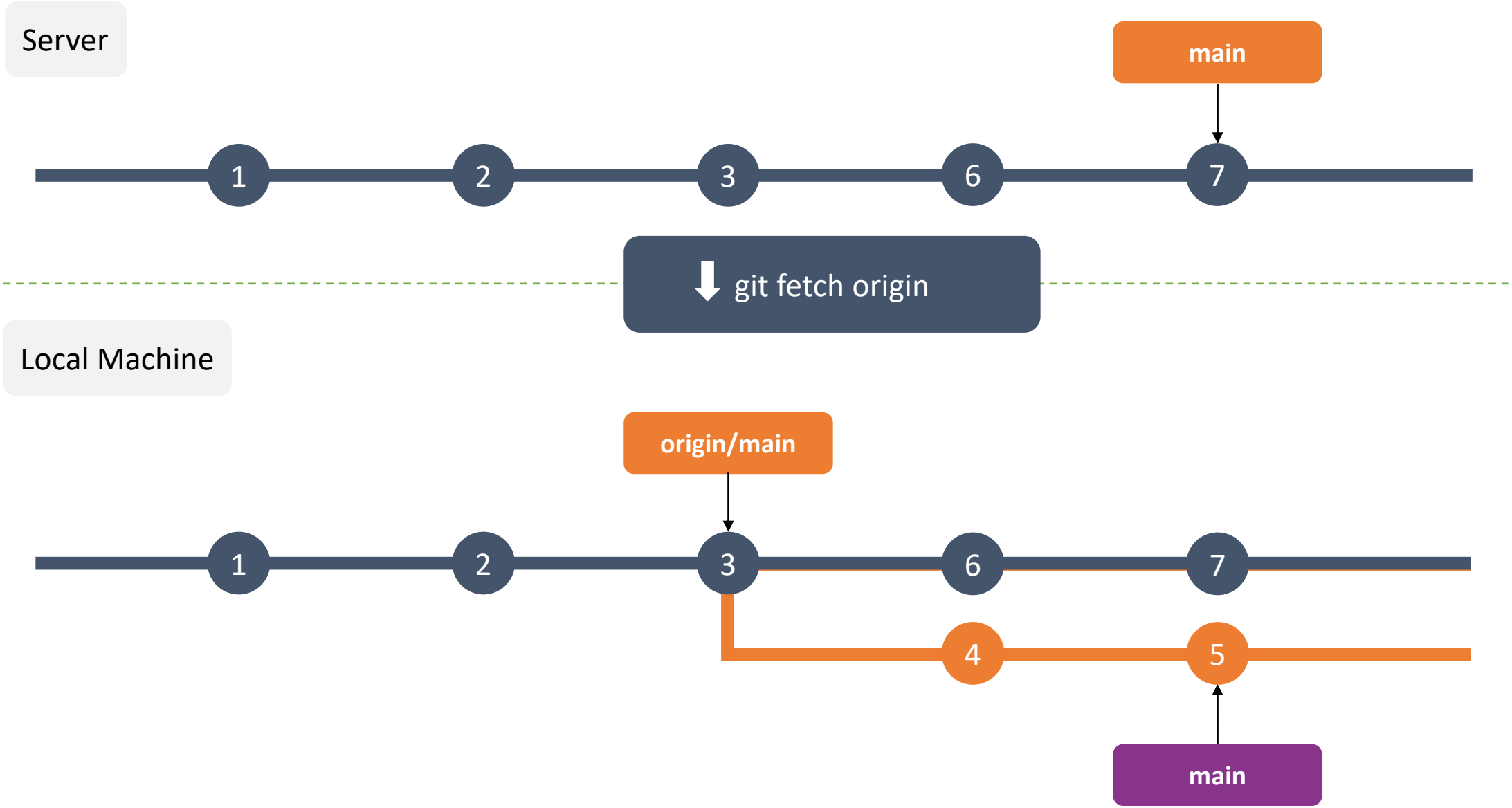

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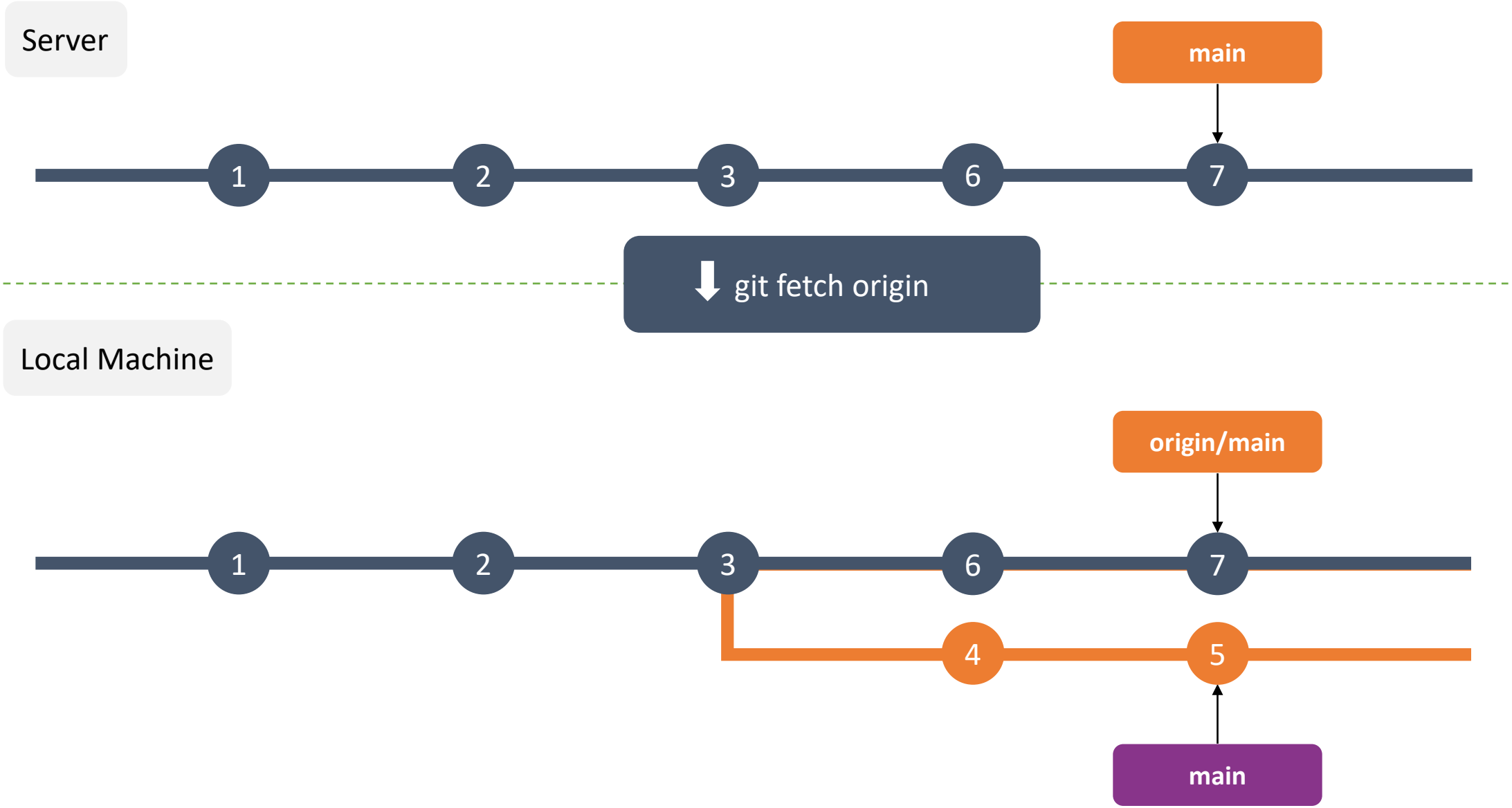

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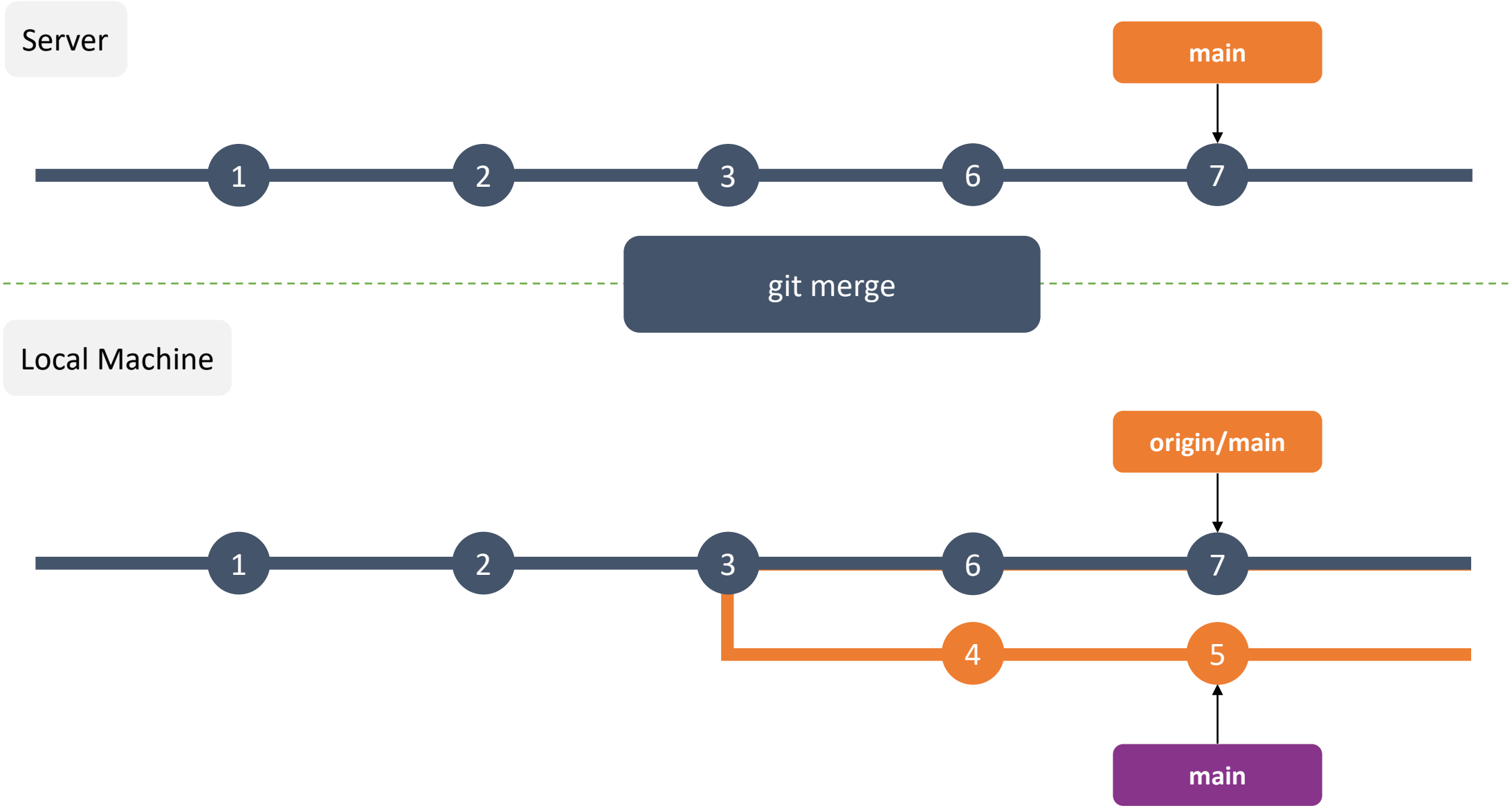

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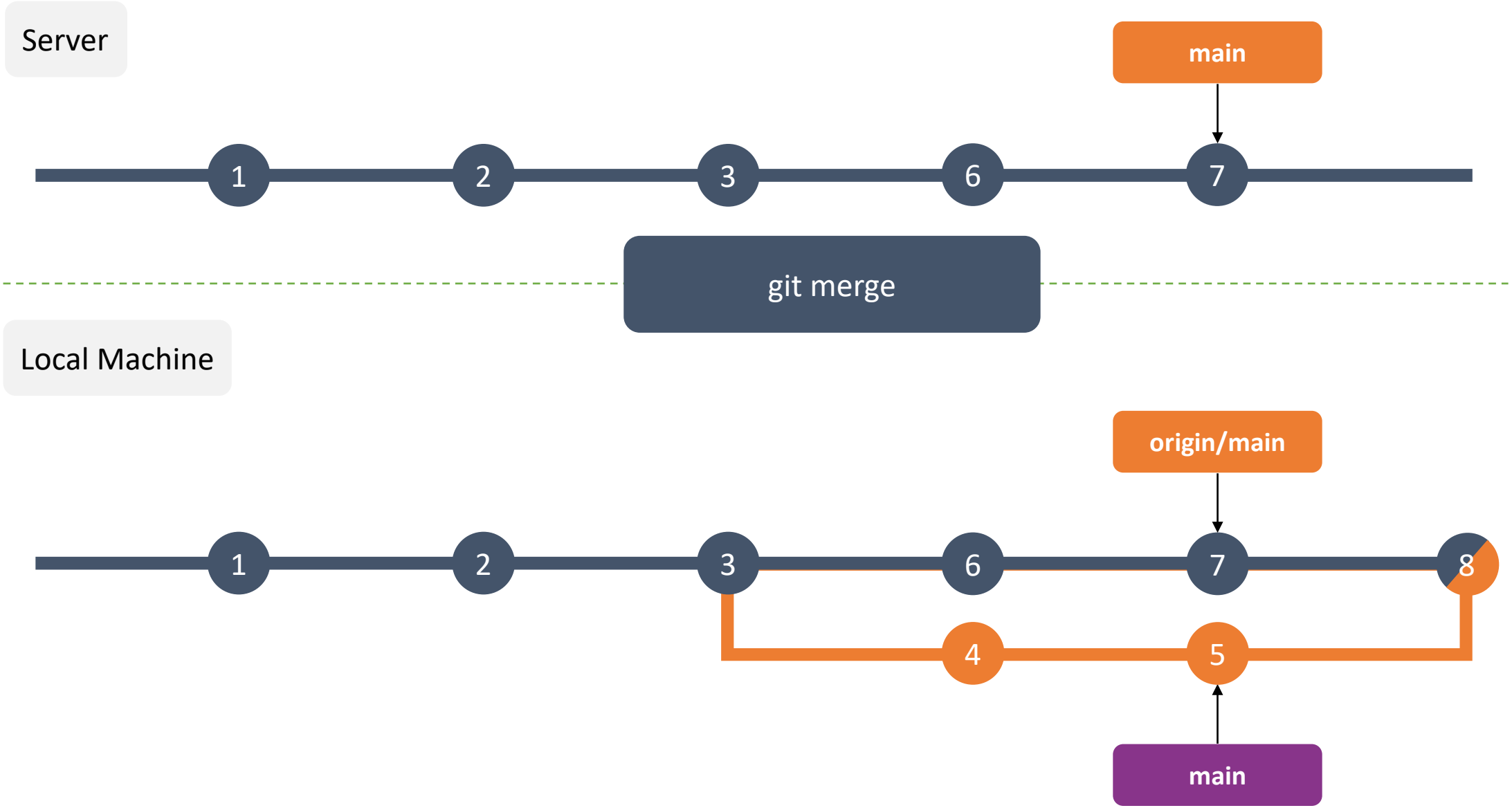

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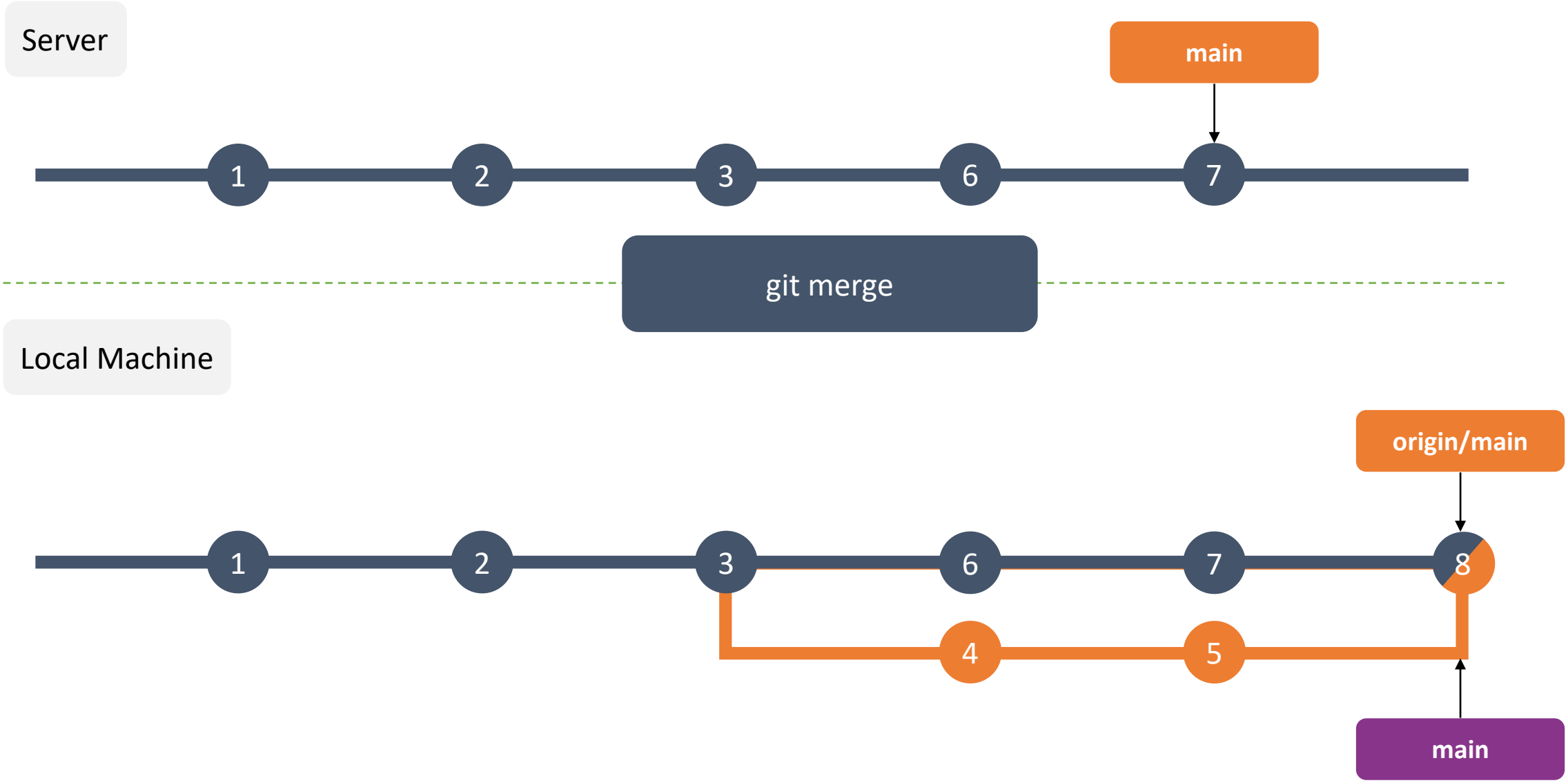

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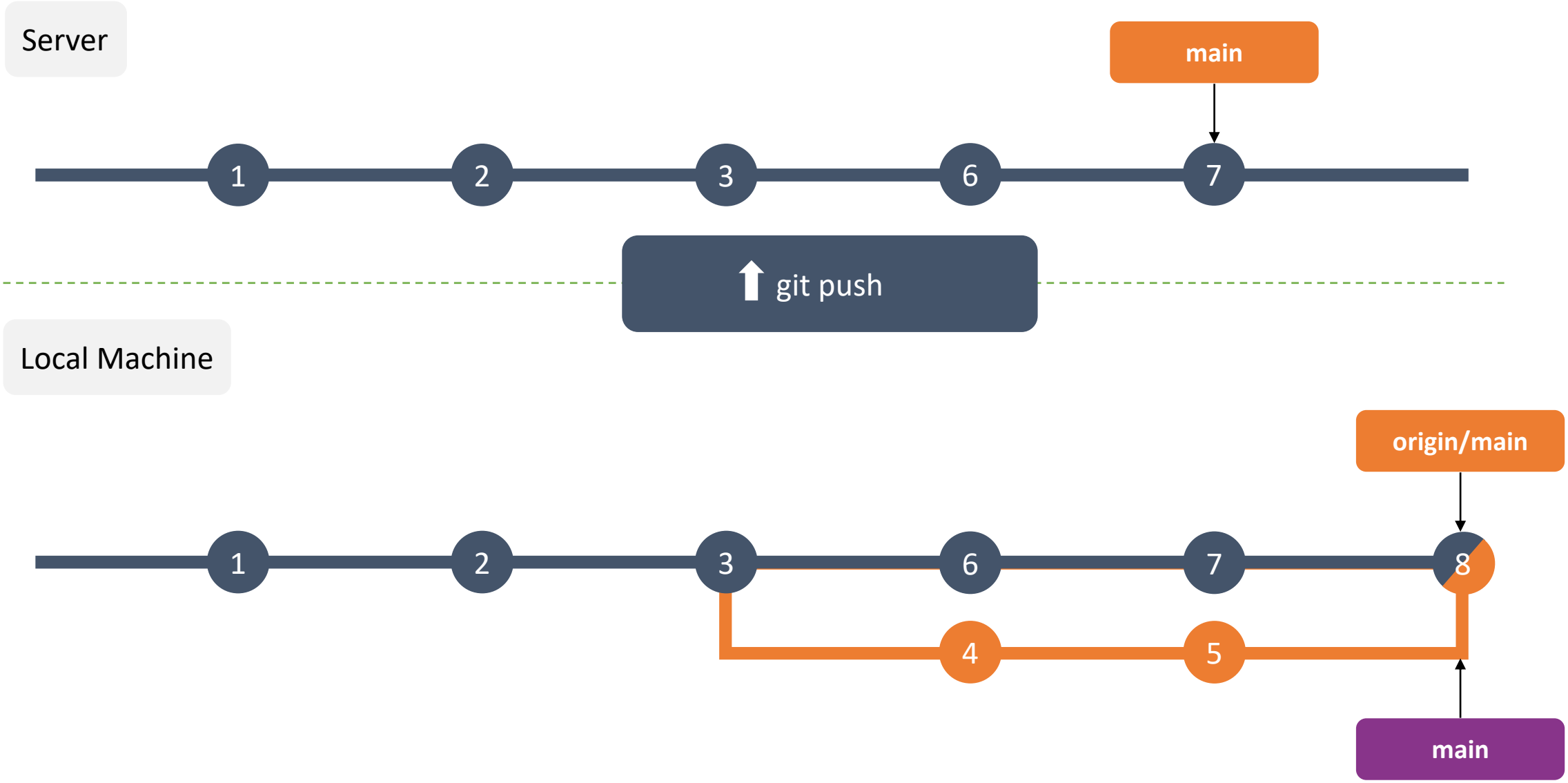

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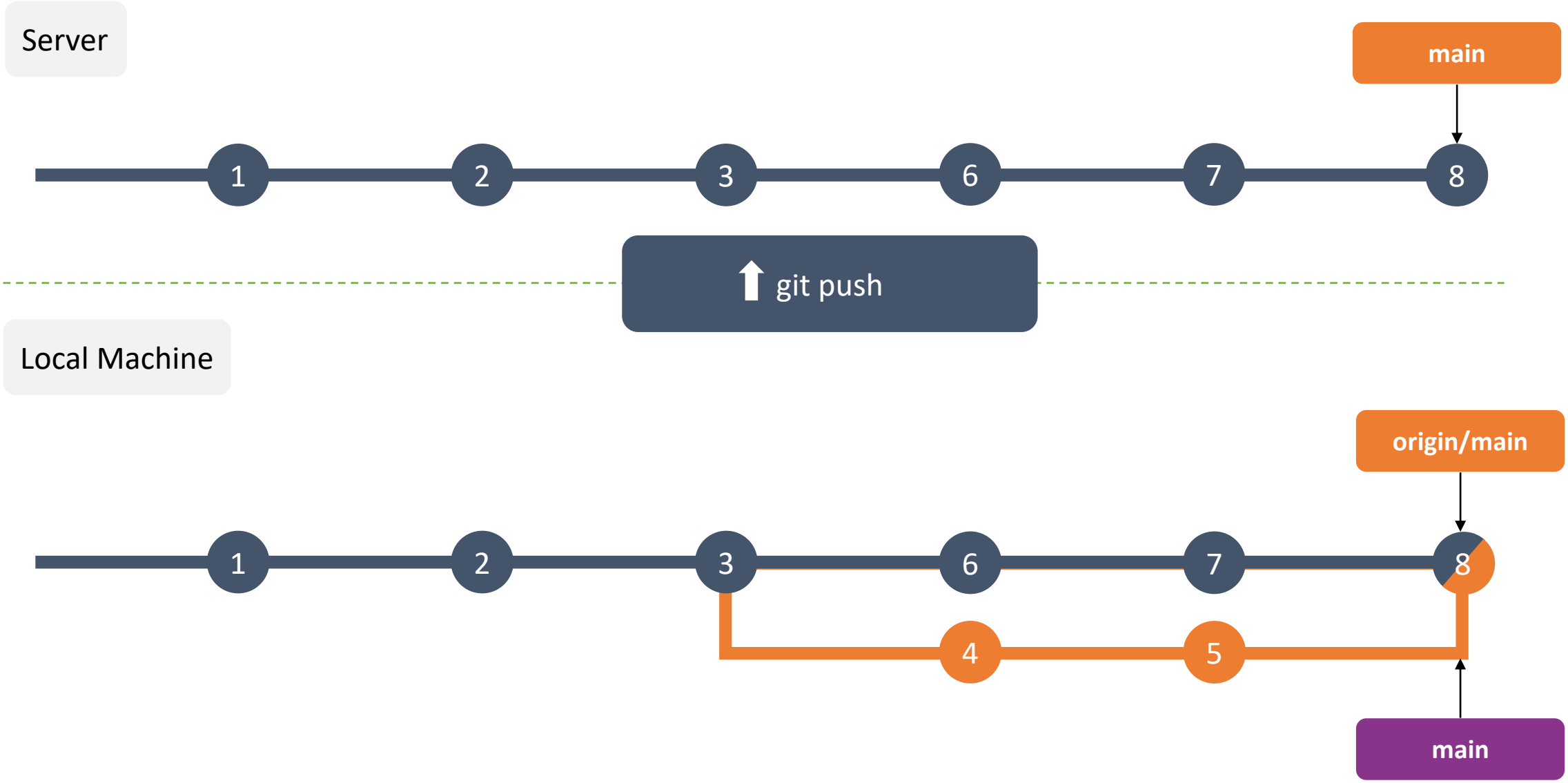


User 1

Scenario 1 – The Local Protocol

Remote Repo

1. Initialize a `bare` repo

Local Repo

2. Initialize a local repo
3. Make changes
4. Add `remote`
5. `Push` to the remote repo

User 2

Scenario 1 – The Local Protocol

Remote Repo

Local Repo

1. `Clone` the remote repo
2. Make changes
3. `Push` to remote

User 1

Scenario 1 – The Local Protocol

Remote Repo

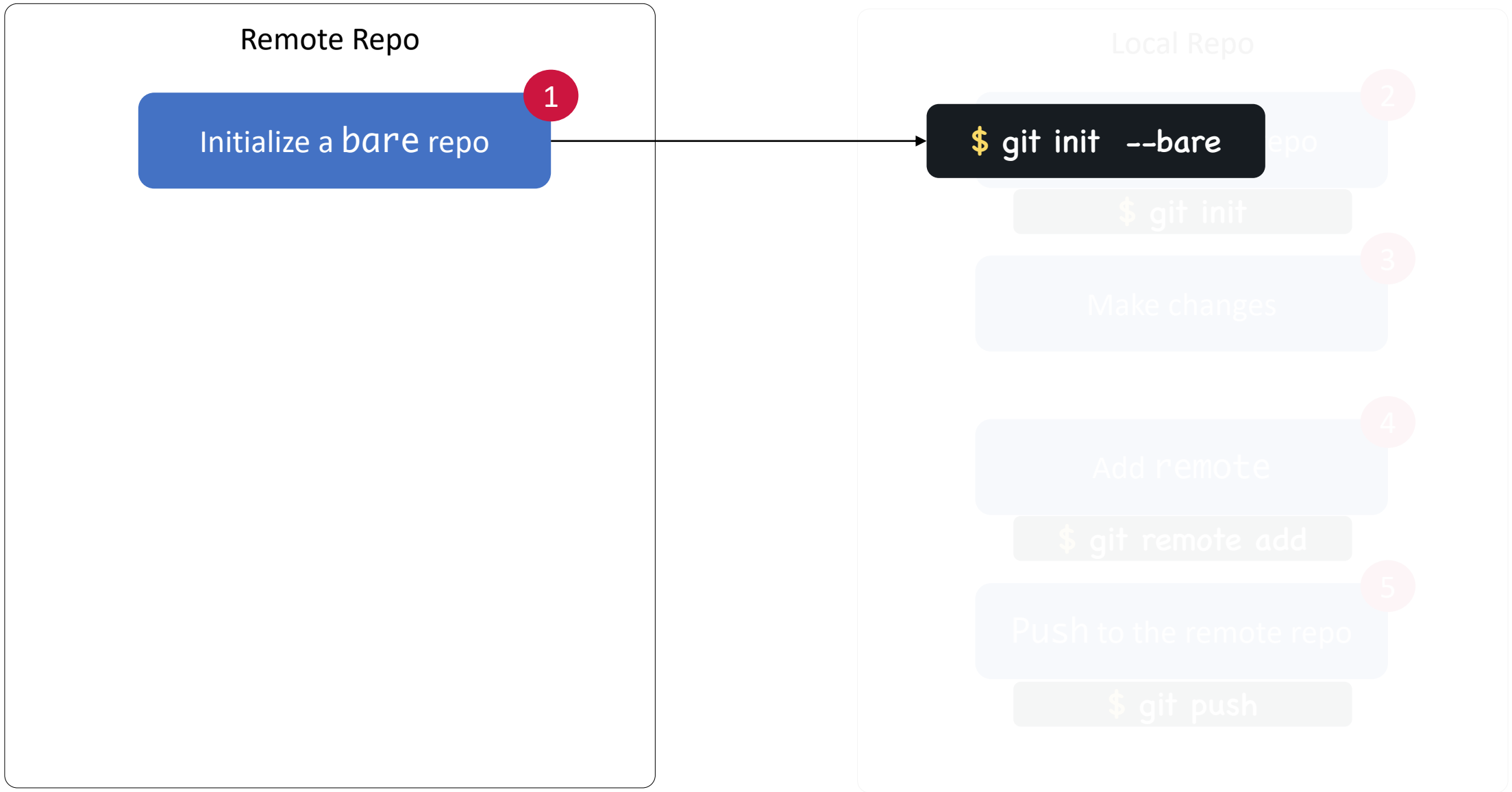
Local Repo

1. Switch to `main` branch
2. Connect branch `upstream`
3. `Fetch` the changes
4. `Merge` the changes

Let us practice

Scenario 1 – Commands

User 1



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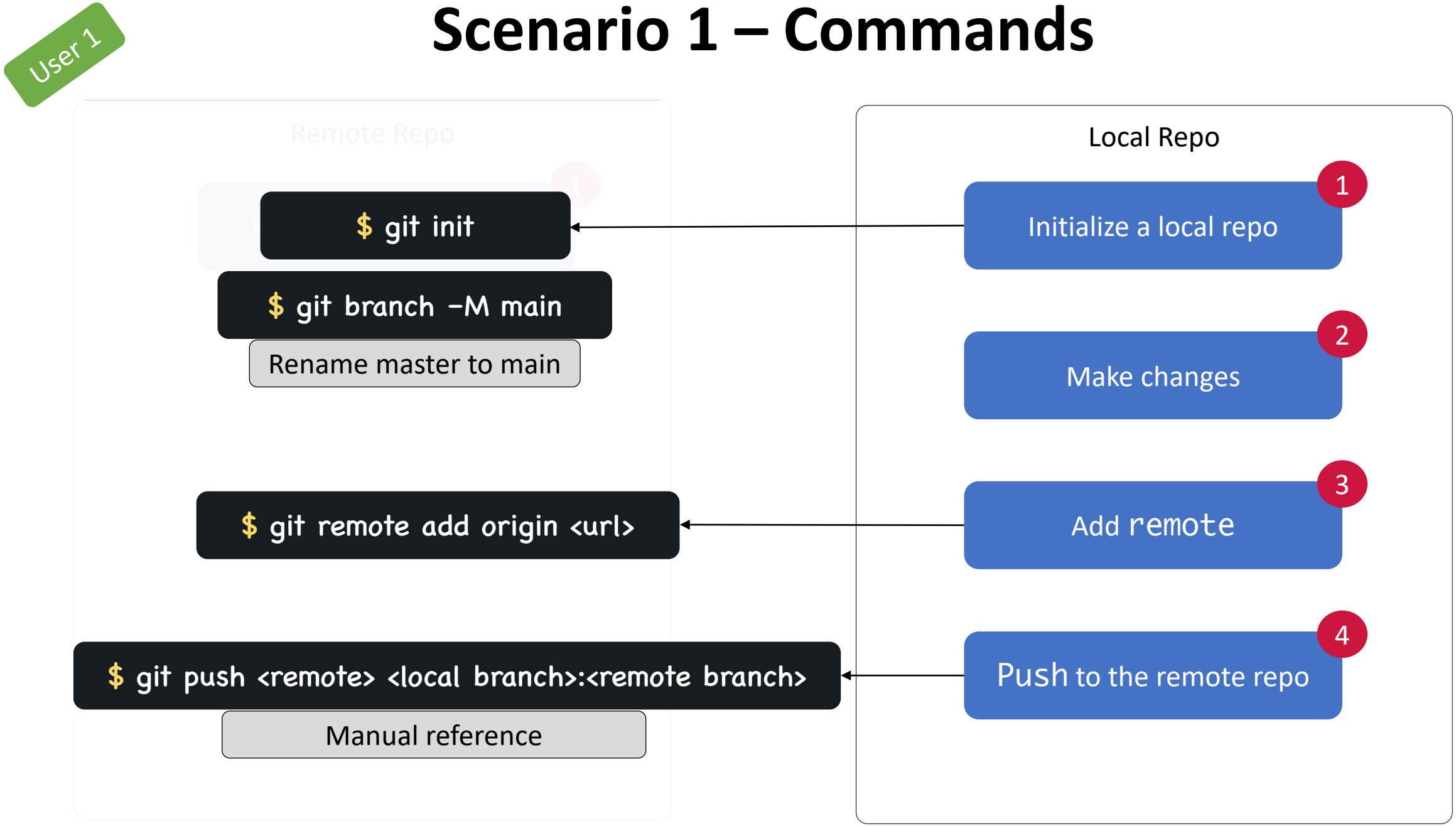

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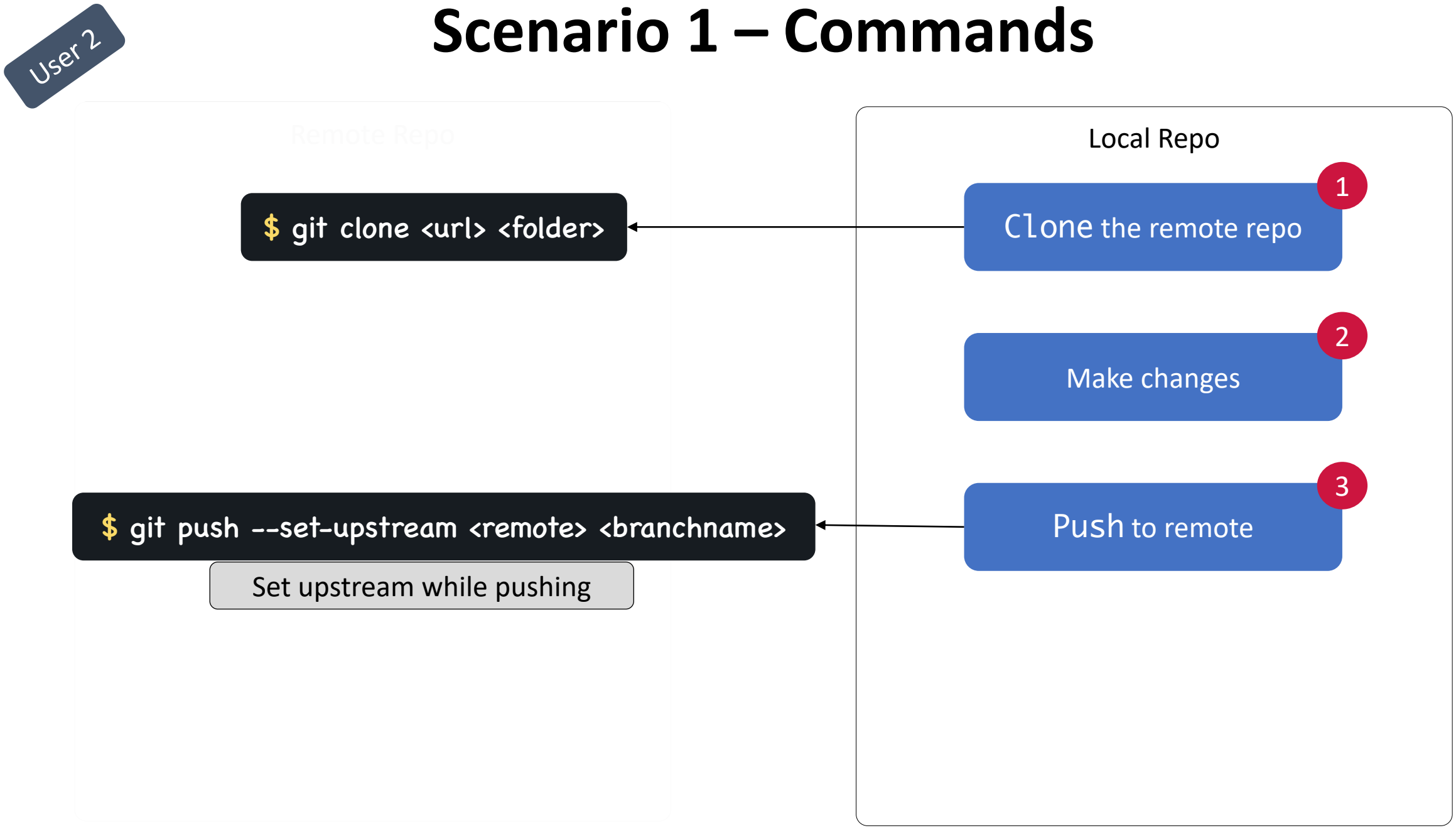

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