Git, branches and you

NEH Institute 2022

Ronald Haentjens Dekker
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Were we ended last time

Commit

Push / Pull
request

Checkout

Pull

Workspace

Local repository
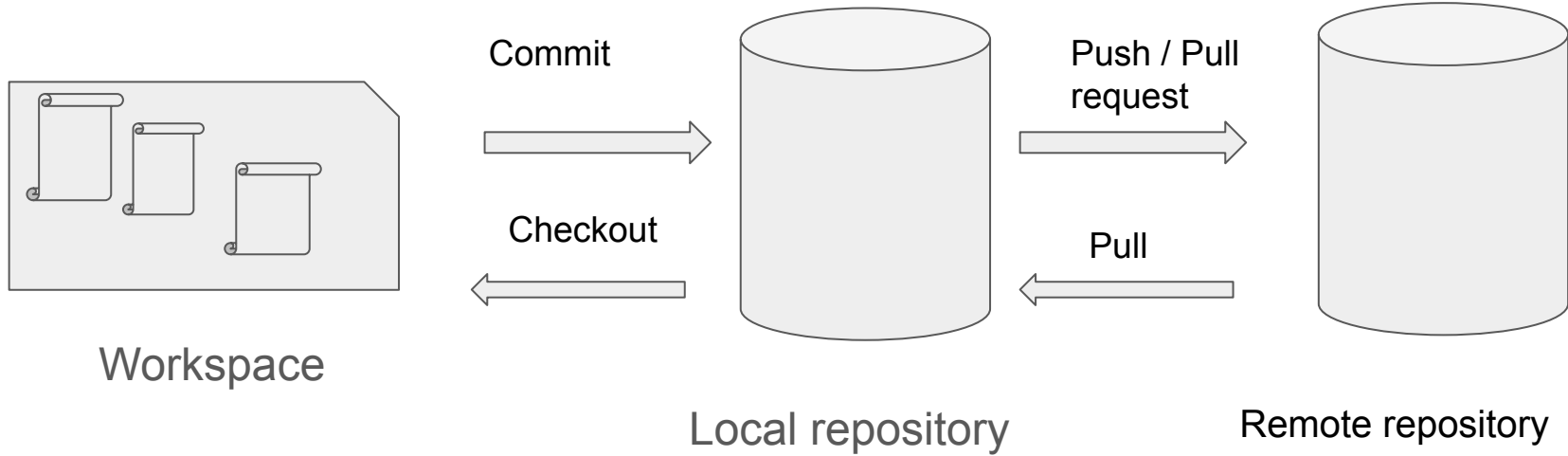
Remote repository

What happens within a repository?

Local repository Team member A

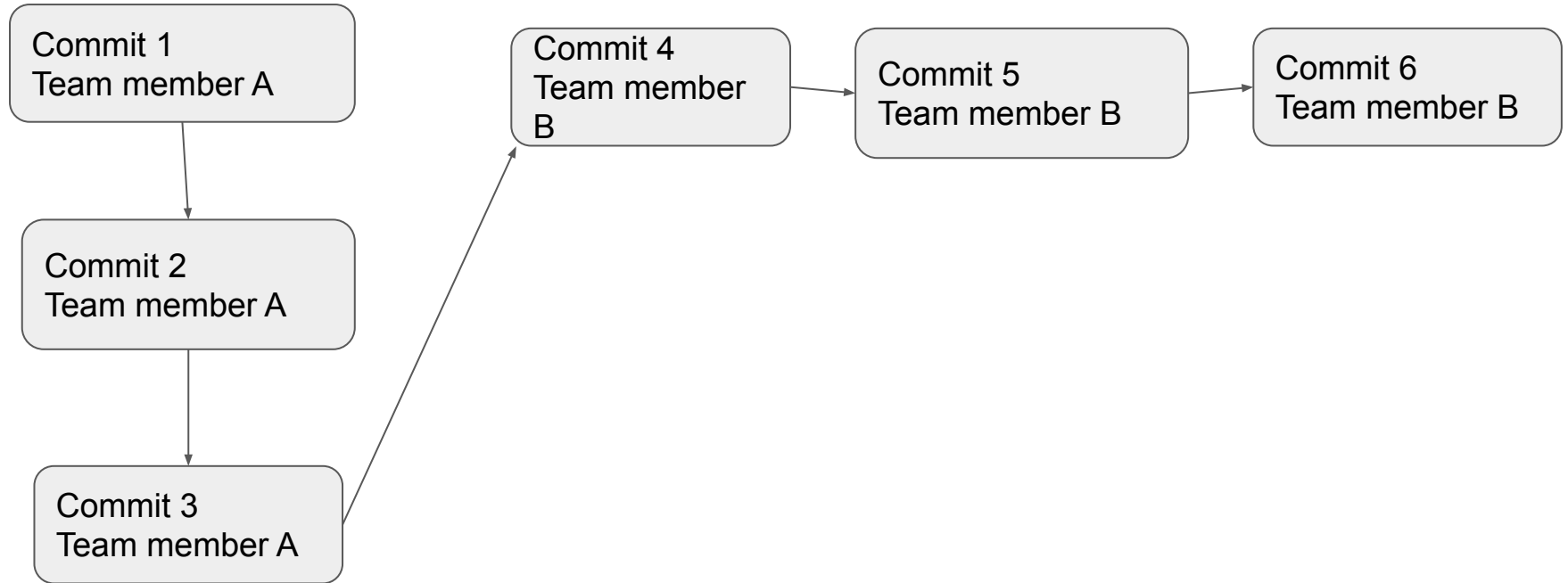| Commit 1 Team member A	→	Commit 2 Team member A	→	Commit 3 Team member A
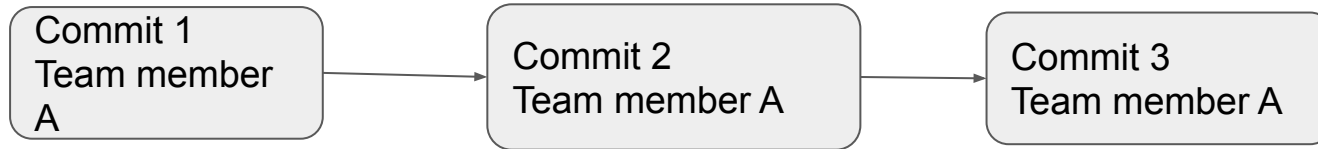
Commits are changeset on a set of files

Team member A pushes to remote repository

Remote Repository (I)

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A
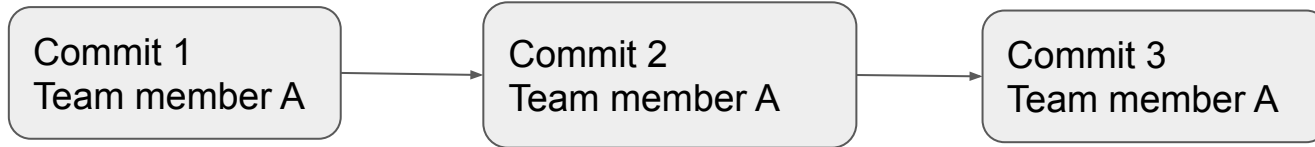
Remote Repository (II) Team Member B pushes changes

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A

Commit 4
Team member B

Commit 5
Team member B

Commit 6
Team member B

Local Repository Team Member A

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A

Commit 4a
Team member A

Commit 5a
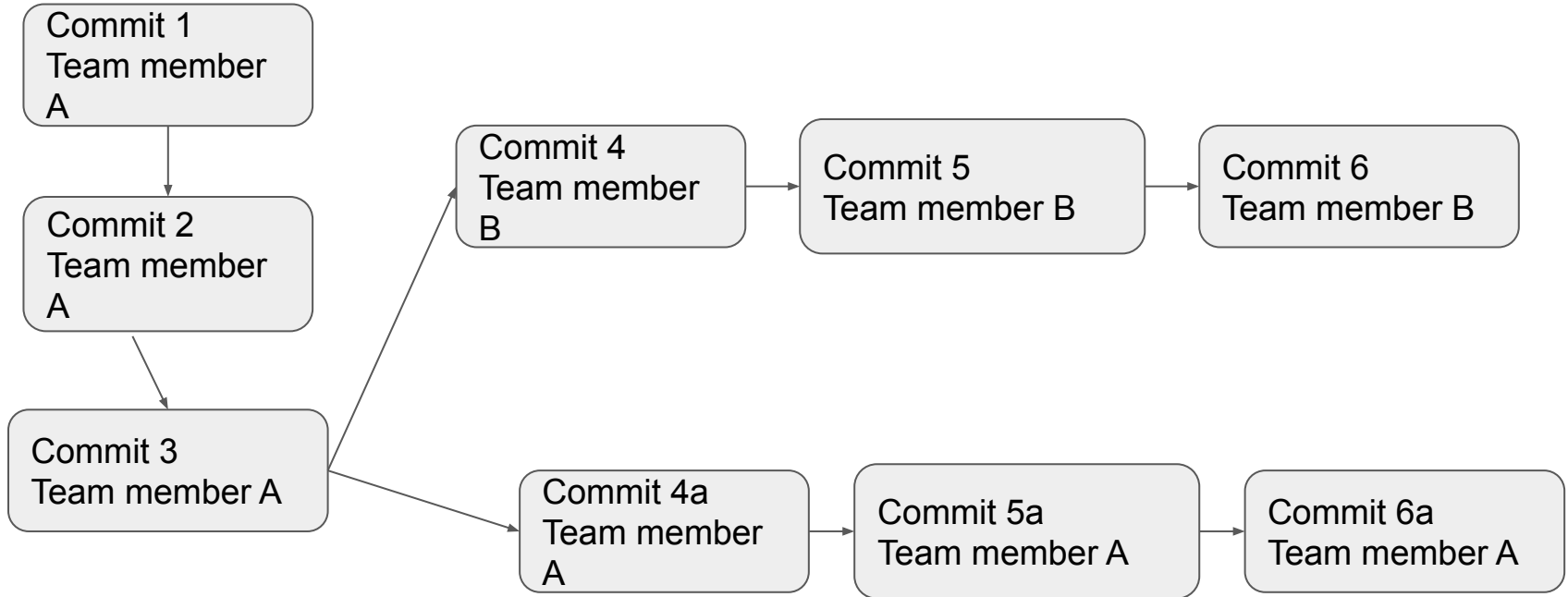Team member A
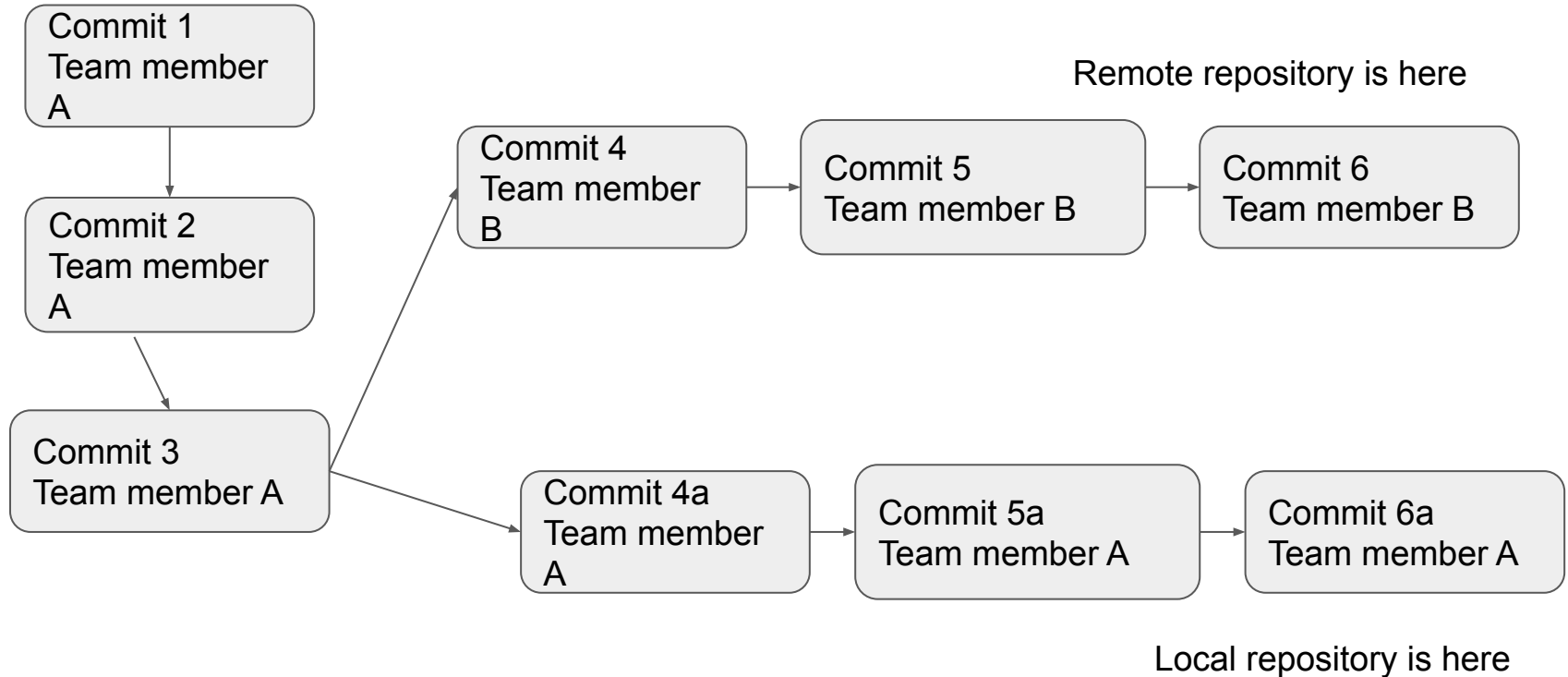
Commit 6a
Team member A
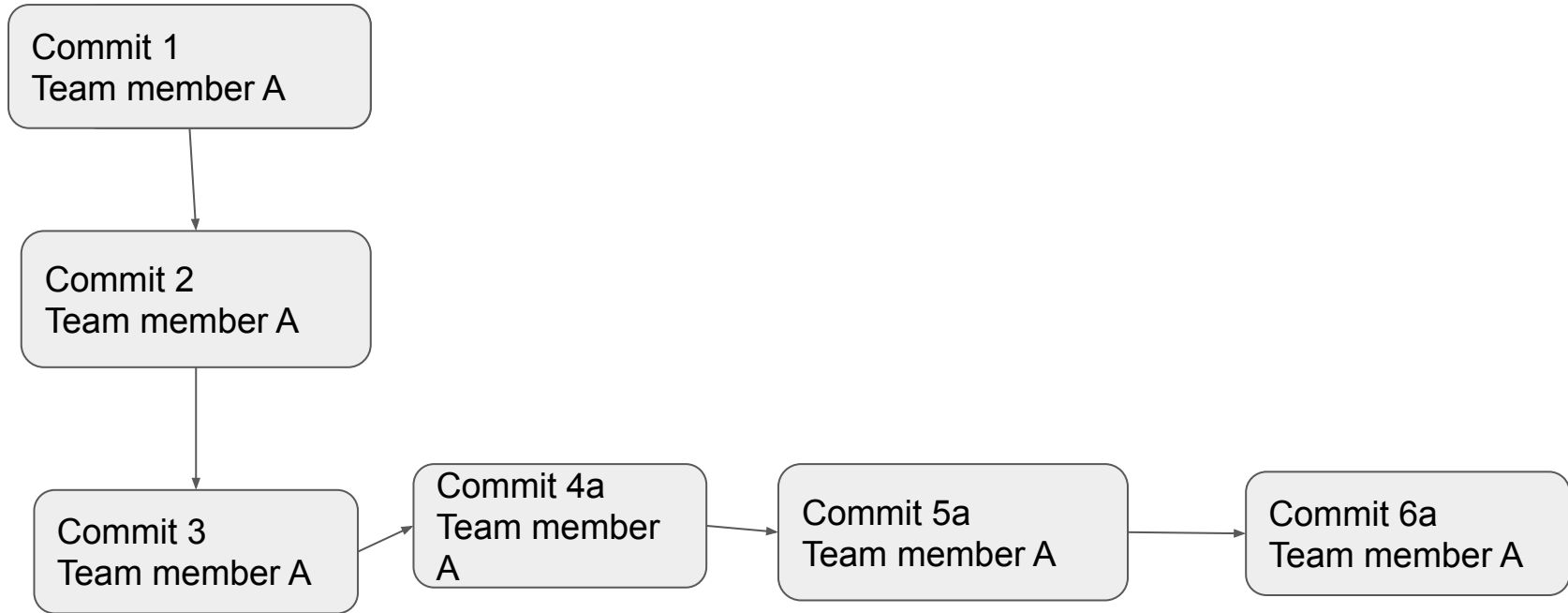
Working together

If team member A tries to push their commits to the remote repository, it will fail.

Why? Remote is further ahead than local repository

Situation is the following

Situation is the following (II)

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A

Commit 4
Team member B

Commit 5
Team member B

Commit 6
Team member B

Remote repository is here

Commit 4a
Team member A

Commit 5a
Team member A

Commit 6a
Team member A

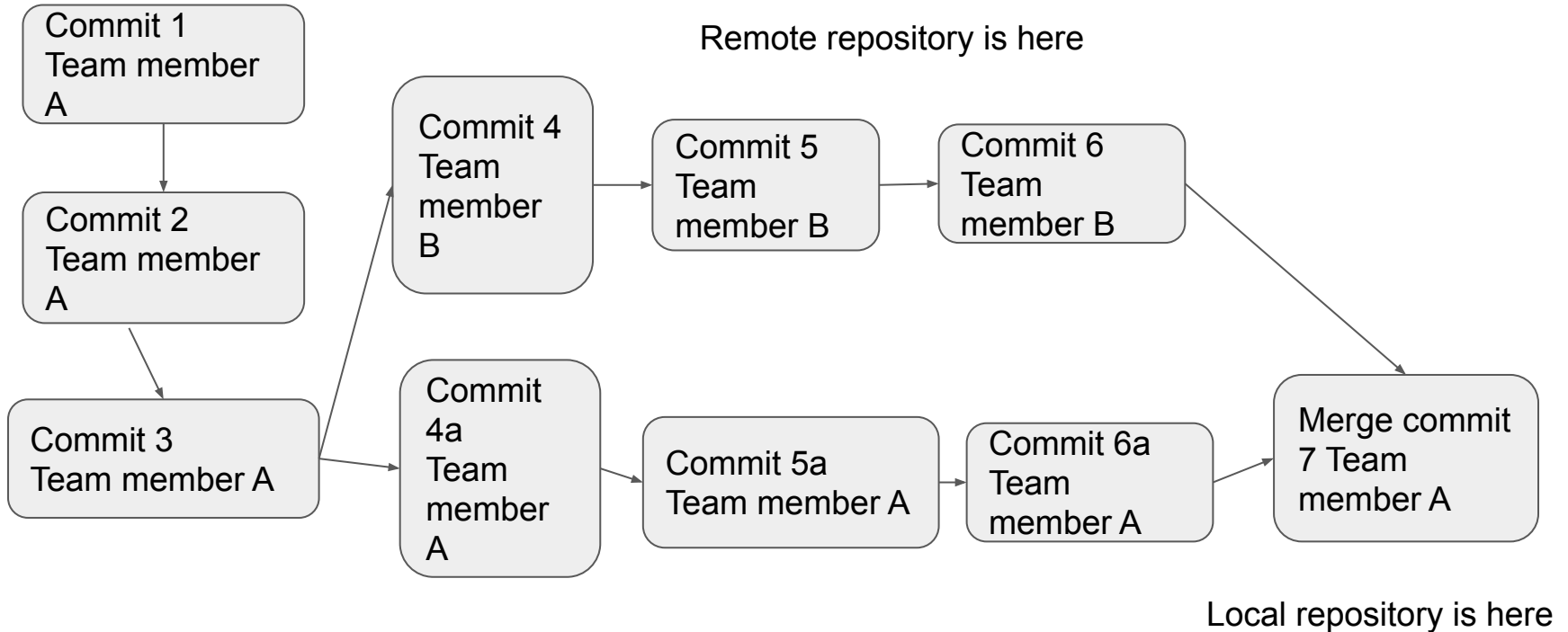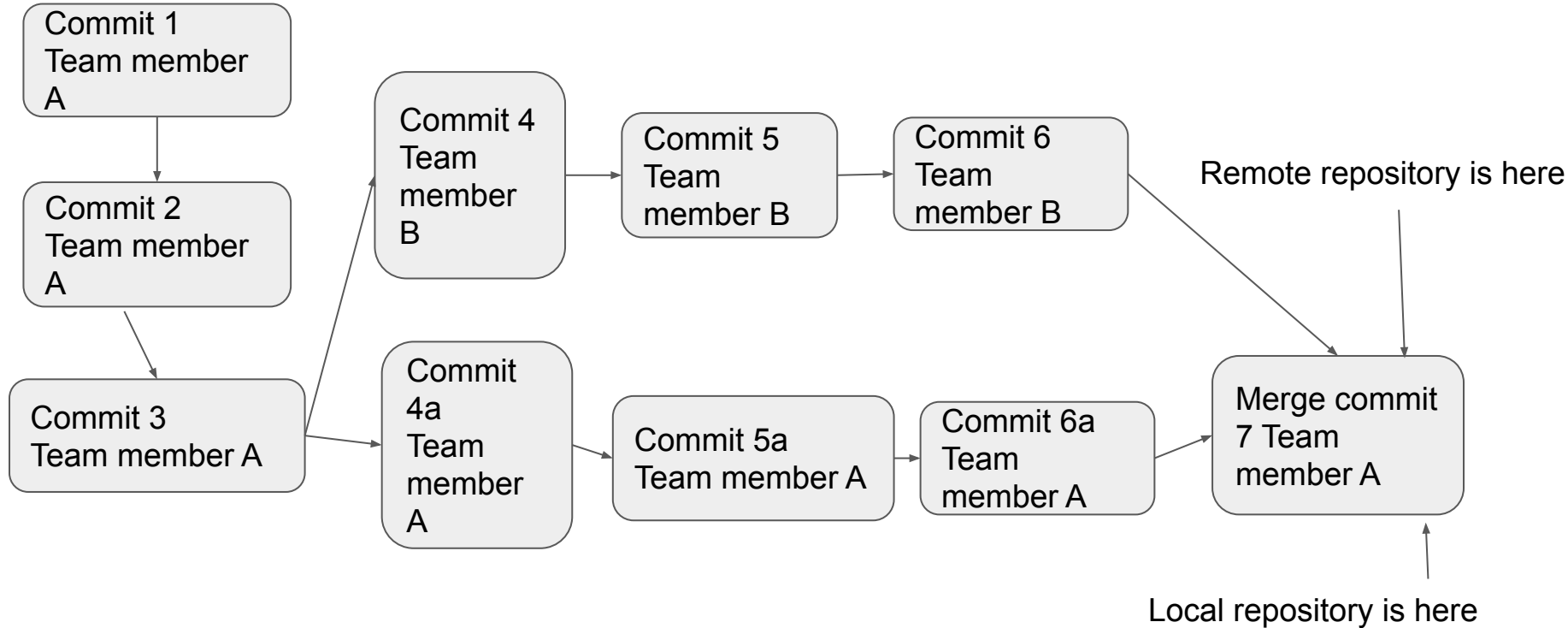Local repository is here

Remote Workflow

1. Clone a repository with **$ git clone <https address>**
2. Make changes to your files
3. Check with **$ git status**
4. Commit your changes
   $ git commit -m "Added insightful comments to a.xml"
5. Sync your local repository with possible remote changes with **$ git pull**
6. Push your changes to remote with **$ git push**
7. Some time passes…
8. Sync your local repository with possible remote changes with **$ git pull**
9. Make changes
10. Repeat

What does pull do?

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A

Commit 4
Team member B

Commit 5
Team member B

Commit 6
Team member B

Remote repository is here

Commit 4a
Team member A

Commit 5a
Team member A

Commit 6a
Team member A

Merge commit 7 Team member A

Local repository is here

What does push do?

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A

Commit 4
Team member B

Commit 5
Team member B

Commit 6
Team member B

Commit 4a
Team member A

Commit 5a
Team member A

Commit 6a
Team member A

Merge commit 7 Team member A

Remote repository is here

Local repository is here

Branches

Default branch is called main or master

Commit 1
Team member
A

↑
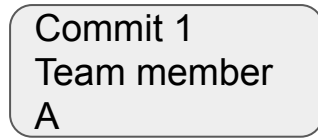
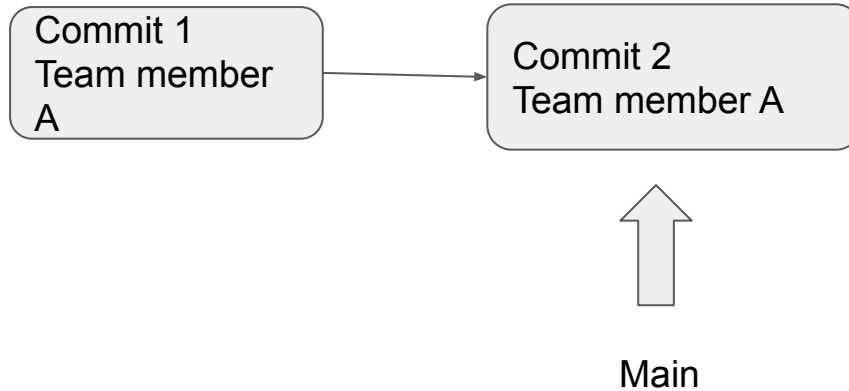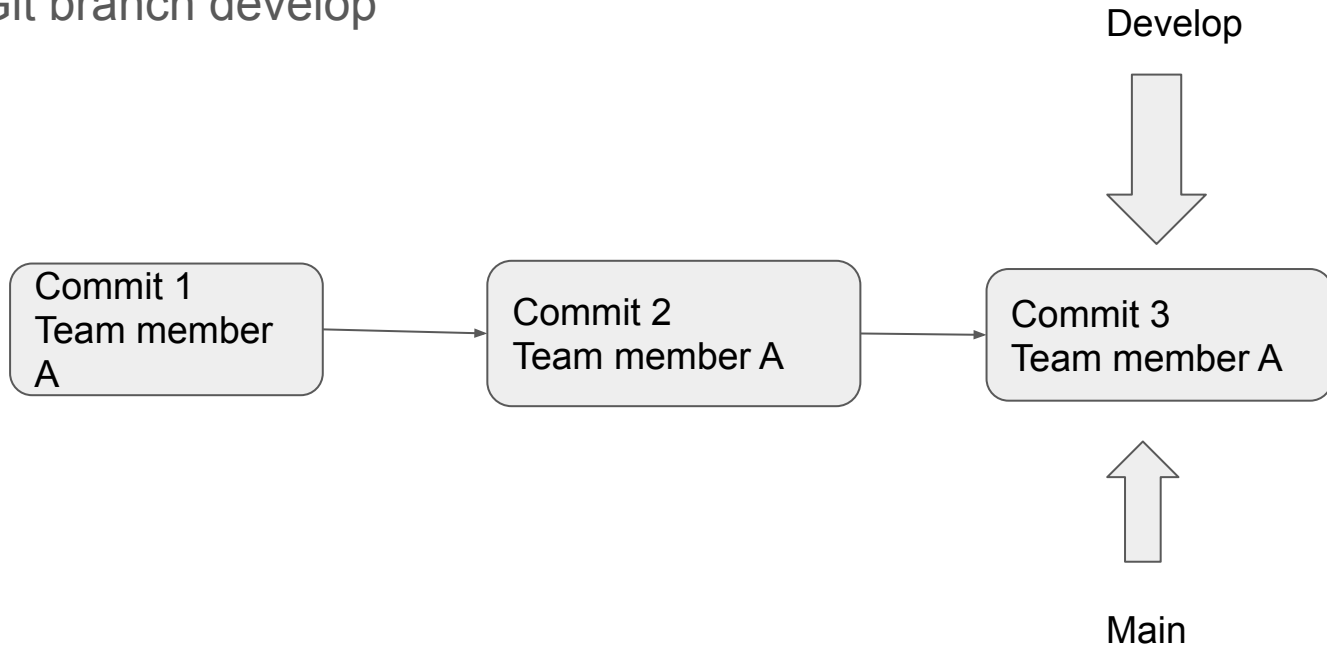Main

Branches (II)

Default branch is called main or master

Branches (III)

Default branch is called main or master

Creating a development branch
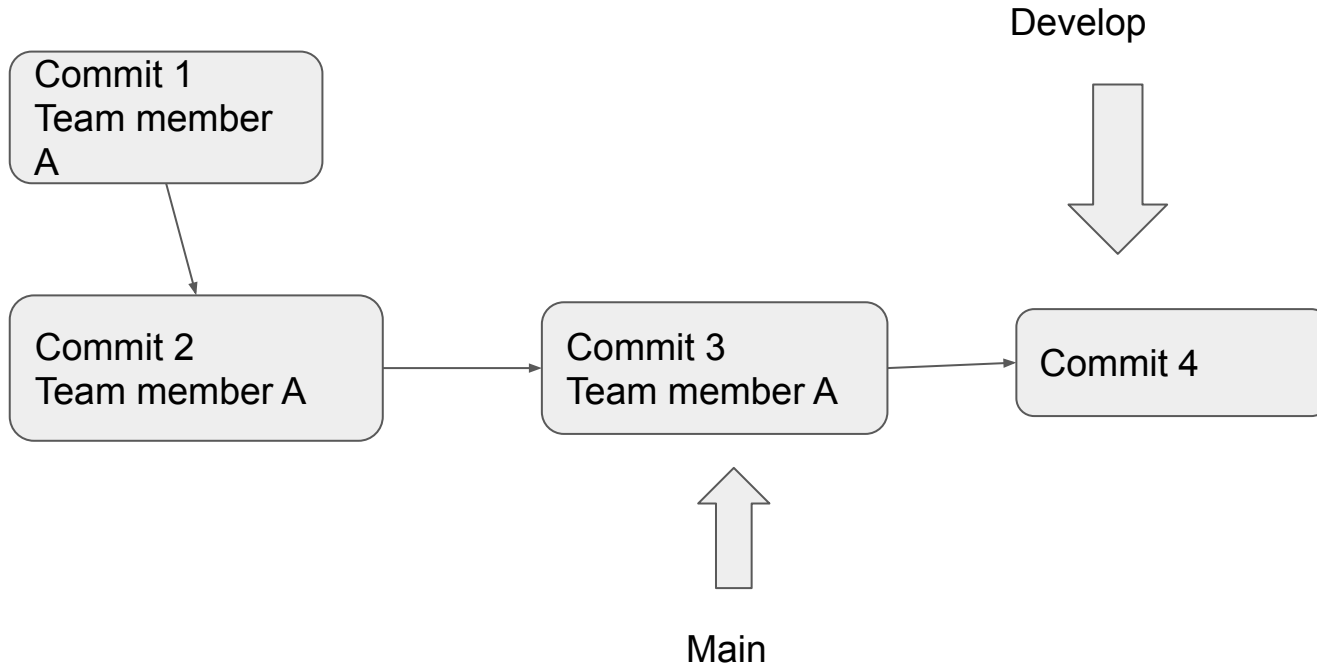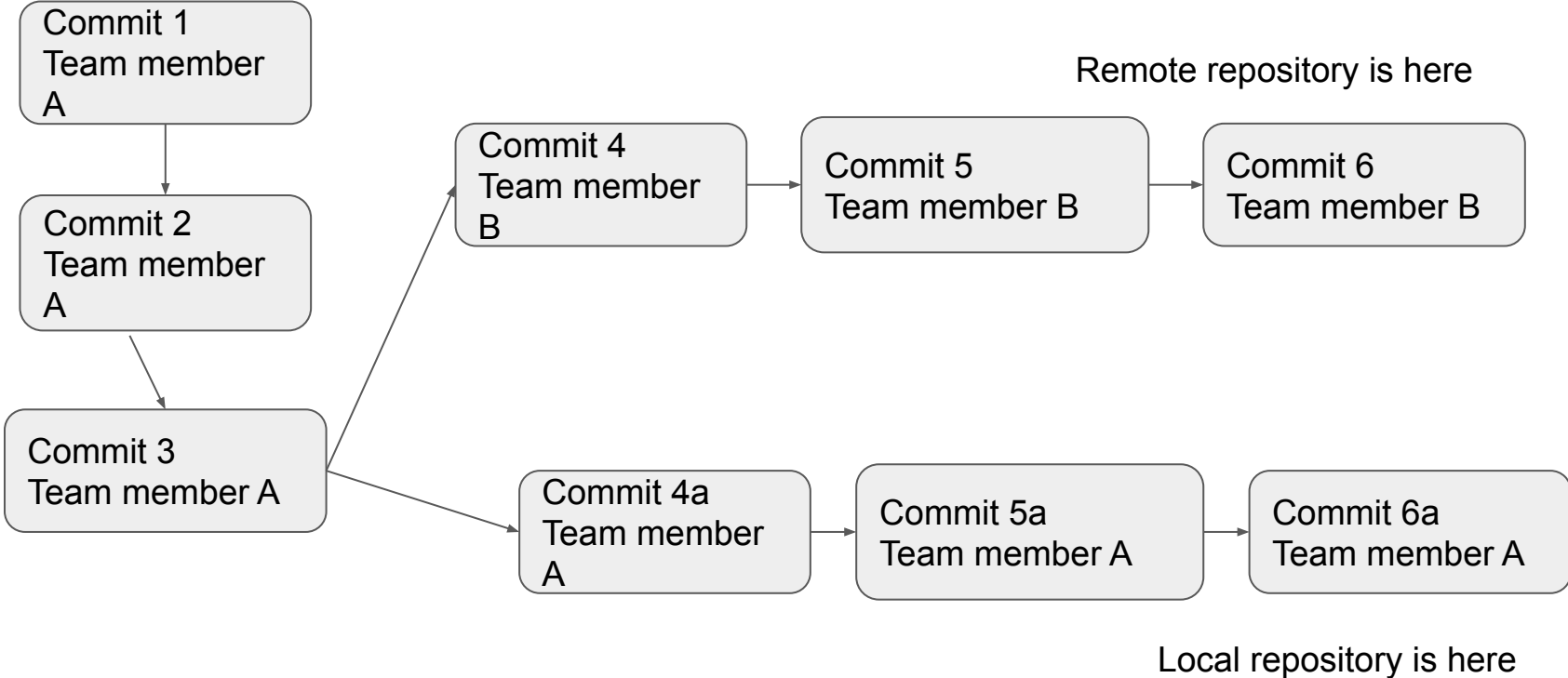
$ Git branch develop

Develop

Commit 1
Team member
A

Commit 2
Team member A

Commit 3
Team member A

Main

Committing while on develop branch

Commit 1
Team member A

Commit 2
Team member A

Commit 3
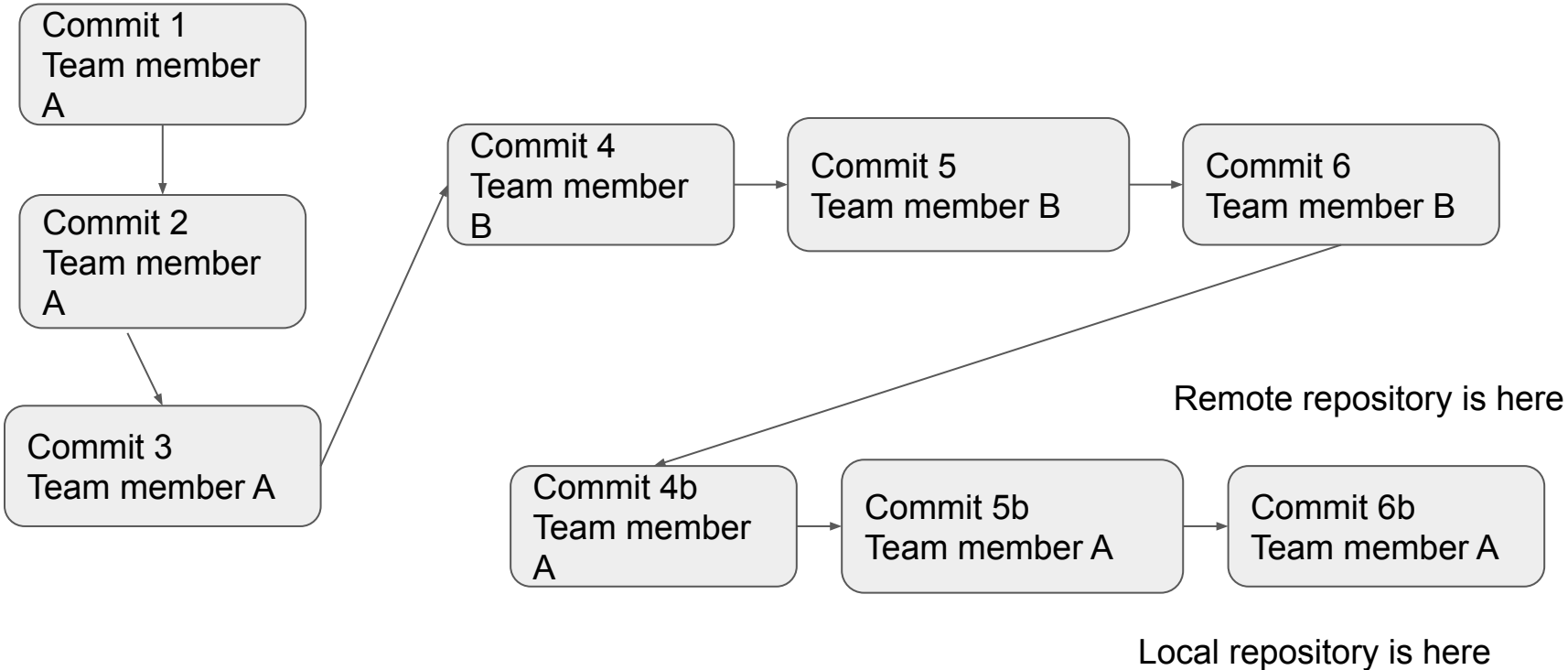Team member A

Commit 4

Develop

Main

Different branch strategies

- Only a main branch
- A main and development branch
    - Main is the stable branch;
    - All new development happens in the second branch
- Feature branches
    - Each new feature gets its own branch
    - Only merged into the main branch when it's finished

Rebase base before

Rebase base after

Commit 1
Team member A

Commit 2
Team member A

Commit 3
Team member A

Commit 4
Team member B

Commit 5
Team member B

Commit 6
Team member B

Remote repository is here

Commit 4b
Team member A

Commit 5b
Team member A

Commit 6b
Team member A

Local repository is here

Misc

Branching and merging

Difference between merge and rebase

Difference between pull and fetch

      Pull is fetch plus merge