

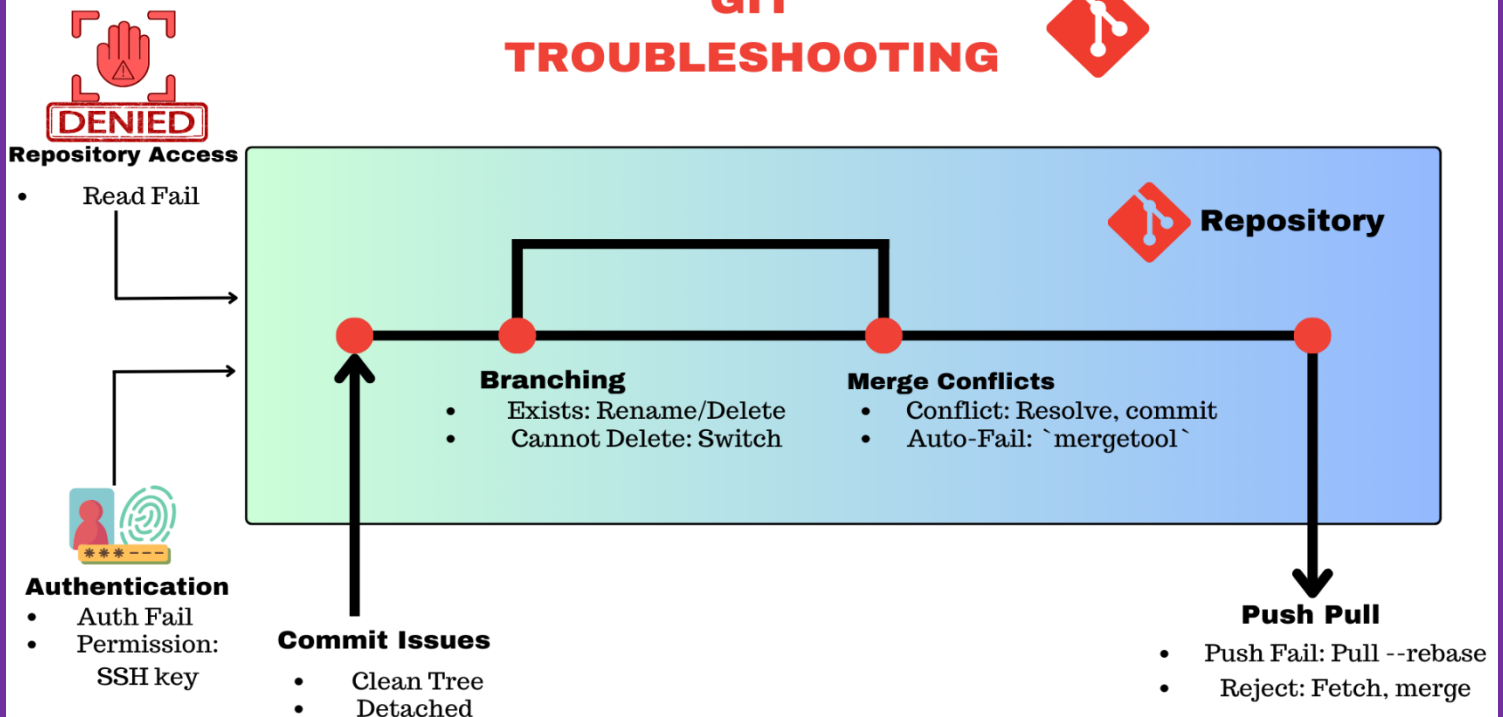


Git Troubleshooting Guide

1. Introduction

Git is an open-source distributed version control system widely used for tracking changes in source code during software development. It allows multiple developers to collaborate seamlessly, managing codebases with branches, merges, commits, and more. However, Git's versatility can also lead to a range of challenges. This guide is designed to address common Git troubleshooting issues, with solutions to common problems that arise.

GIT TROUBLESHOOTING



At the end, a checklist provides a quick reference for efficient troubleshooting.

2. Authentication Issues

Permission Denied (publickey)

- **Description:** This error appears when Git is unable to authenticate using the SSH key required for access.
- **Causes:**
 - The SSH key is not configured correctly in Git.
 - The key has not been added to the SSH agent or Git hosting platform.
- **Solution:**
 - Verify the SSH key is present in ~/.ssh/.
 - Add the SSH key to your agent using:

```
ssh-add ~/.ssh/id_rsa
```

- Configure SSH keys in Git hosting platform (GitHub, GitLab).
- **Example Command:**

```
ssh -T git@github.com
```

This command tests if the SSH connection is working.

Authentication Failed

- **Description:** This error occurs when Git cannot authenticate due to invalid or expired credentials, usually with HTTPS access.
- **Causes:**
 - Credentials have expired.
 - Issues with Git credential manager.
- **Solution:**
 - Update or reconfigure Git credentials with:

```
git credential-manager-core erase
```

- Configure a personal access token if using two-factor authentication.

3. Repository Access Issues

Could Not Read from Remote Repository

- **Description:** Git is unable to access the remote repository.
- **Causes:**
 - The remote repository URL is incorrect.
 - User lacks proper permissions.
- **Solution:**
 - Verify URL using:

```
git remote -v
```

- Update the URL if incorrect:

```
git remote set-url origin <correct-URL>
```

- Ensure you have the necessary permissions on the repository.

Remote Branch Not Found

- **Description:** This occurs when the specified branch does not exist remotely.
- **Causes:**
 - Incorrect branch name spelling.
 - Branch has not been pushed to remote.
- **Solution:**
 - Verify the branch name using:

```
git branch -r
```

- Push the branch to remote if it does not exist:

```
git push -u origin <branch-name>
```

4. Merge Conflicts

Merge Conflict in <file>

- **Description:** Conflicts arise when there are conflicting changes in a file.
- **Solution:**
 - Manually resolve conflicts by editing files and choosing correct changes.
 - Stage the resolved changes:

```
git add <file>
```

- Commit the merged changes:

```
git commit -m "Resolved merge conflict"
```

Automatic Merge Failed

- **Description:** Git cannot resolve the conflict automatically.
- **Solution:**
 - Use git mergetool if configured, or manually resolve conflicts and commit changes.

5. Commit Issues

Nothing to Commit, Working Tree Clean

- **Description:** Git shows this message when there are no staged changes to commit.
- **Solution:**
 - Save and stage changes:

```
git add <file>
```

- Ensure that files are tracked by Git.

Detached HEAD State

- **Description:** Detached HEAD means that the HEAD pointer is not on any branch.
- **Solution:**
 - Switch back to a branch with:

```
git checkout <branch-name>
```

- To create a new branch from the detached state:

```
git switch -c <new-branch-name>
```

6. Branching Issues

Branch Already Exists

- **Description:** This error occurs when trying to create a branch with an existing name.
- **Solution:**
 - Use a different branch name or delete the existing branch:

```
git branch -d <branch-name>
```

Cannot Delete Branch Checked Out

- **Description:** Git won't delete a branch that is currently checked out.
- **Solution:**
 - Switch to another branch:

```
git checkout <another-branch>
```

7. Push/Pull Issues

Failed to Push Some Refs

- **Description:** This issue arises when there are upstream changes not in your local branch.
- **Solution:**
 - Use rebase to incorporate changes:

```
git pull --rebase
```

- Push changes after successful rebase:

```
git push
```

Updates Rejected due to Remote Changes

- **Description:** Git rejects your push when there are remote changes you do not have.
- **Solution:**
 - Fetch remote changes and merge:

```
git fetch
```

```
git merge
```

8. Checklist for Troubleshooting Git Issues

Authentication

- ☐ SSH keys configured and added.
- ☐ Correct credentials or tokens for HTTPS access.

Repository Access

- ☐ Verify remote URL and permissions.
- ☐ Confirm branch names and existence.

Merge Conflicts

- ☐ Resolve conflicts manually.
- ☐ Commit resolved changes.

Commit Issues

- ☐ Ensure files are staged before committing.
- ☐ Check for detached HEAD and switch branches if needed.

Branching

- ☐ Check branch names to avoid duplicates.
- ☐ Switch branches before deletion if required.

Push/Pull

- ☐ Pull with rebase if push fails due to upstream changes.
- ☐ Fetch and merge remote updates if push is rejected.