

Операционные системы

Продвинутое использование git

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2025-12-08

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1. Цели и задачи работы

1.1 Цель лабораторной работы

Получение навыков правильной работы с репозиториями git.

1.2 Задачи лабораторной работы

- 1 Выполнить работу для тестового репозитория.
- 2 Преобразовать рабочий репозиторий в репозиторий с git-flow и conventional commits.

2. Процесс выполнения лабораторной работы

2.1 Node.js

```
aachernyatin@aachernyatin:~$ pnpm setup
bash: pnpm: command not found...
aachernyatin@aachernyatin:~$ pnpm setup
Appended new lines to /home/aachernyatin/.bashrc

Next configuration changes were made:
export PNPM_HOME="/home/aachernyatin/.local/share/pnpm"
case ":$PATH:" in
  *":$PNPM_HOME:*") ;;
  *) export PATH="$PNPM_HOME:$PATH" ;;
esac

To start using pnpm, run:
source /home/aachernyatin/.bashrc
aachernyatin@aachernyatin:~$ source ~/.bashrc
aachernyatin@aachernyatin:~$
```

Рисунок 1: Node.js

2.2 commitizen

```
aachernyatin@aachernyatin:~$  
aachernyatin@aachernyatin:~$ pnpm add -g commitizen  
  
Update available! 10.9.0 → 10.24.0.  
Changelog: https://pnpm.io/v/10.24.0  
To update, run: pnpm self-update  
  
WARN 2 deprecated subdependencies found: glob@7.2.3, inflight@1.0.6  
Packages: +151  
+-----  
Progress: resolved 151, reused 0, downloaded 151, added 151, done  
  
/home/aachernyatin/.local/share/pnpm/global/5:  
+ commitizen 4.3.1  
  
Done in 3.1s using pnpm v10.9.0  
aachernyatin@aachernyatin:~$
```

Рисунок 2: установка commitizen

2.3 standard-changelog

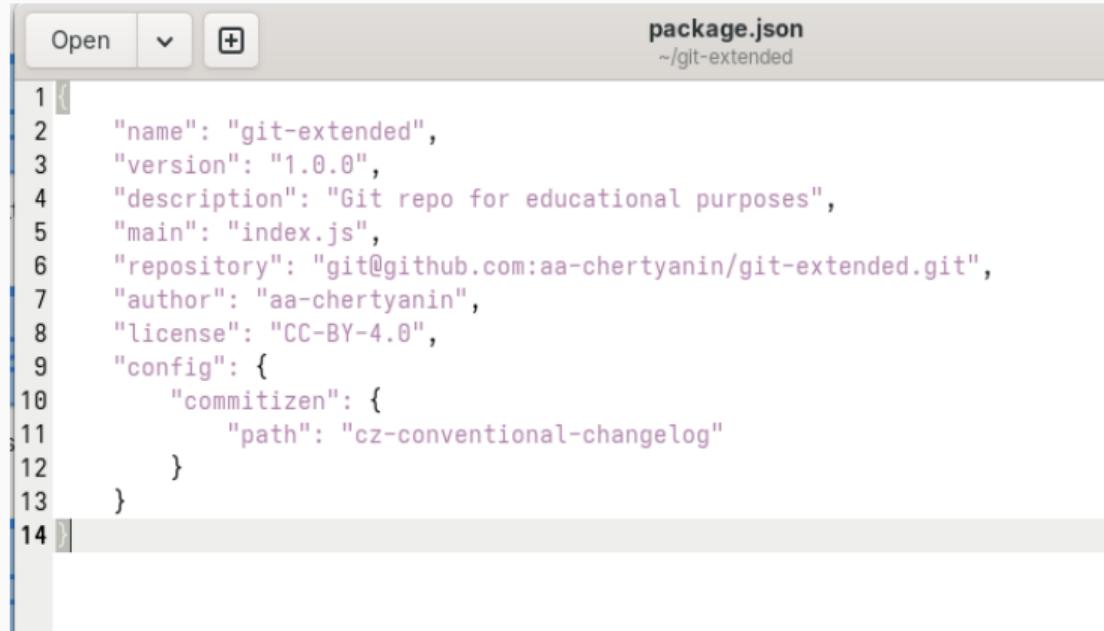
```
aachernyatin@aachernyatin:~$ pnpm add -g standard-changelog
WARN 2 deprecated subdependencies found: glob@7.2.3, inflight@1.0.6
Packages: +34
+++++
Progress: resolved 185, reused 151, downloaded 34, added 34, done

/home/aachernyatin/.local/share/pnpm/global/5:
+ standard-changelog 7.0.1

Done in 1.6s using pnpm v10.9.0
aachernyatin@aachernyatin:~$
```

Рисунок 3: установка standard-changelog

2.4 package.json



The screenshot shows a code editor window with the title bar "package.json" and the path "~/git-extended". The editor has an "Open" button and a "+" button. The code itself is a JSON object with the following structure:

```
1 {
2   "name": "git-extended",
3   "version": "1.0.0",
4   "description": "Git repo for educational purposes",
5   "main": "index.js",
6   "repository": "git@github.com:aa-chertyanin/git-extended.git",
7   "author": "aa-chertyanin",
8   "license": "CC-BY-4.0",
9   "config": {
10     "commitizen": {
11       "path": "cz-conventional-changelog"
12     }
13   }
14 }
```

Рисунок 4: package.json

2.5 Использование commitizen

```
aachernyatin@aachernyatin:~/git-extended$ gedit package.json
aachernyatin@aachernyatin:~/git-extended$ git add .
aachernyatin@aachernyatin:~/git-extended$ git cz
cz-cli@4.3.1, cz-conventional-changelog@3.3.0

? Select the type of change that you're committing: chore: Other changes that don't modify src or test files
? What is the scope of this change (e.g. component or file name): (press enter to skip)
? Write a short, imperative tense description of the change (max 93 chars):
(4) test
? Provide a longer description of the change: (press enter to skip)

? Are there any breaking changes? No
? Does this change affect any open issues? No
[master a5c28e7] chore: test
  1 file changed, 14 insertions(+)
  create mode 100644 package.json
aachernyatin@aachernyatin:~/git-extended$ git push
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 1.12 KiB | 1.12 MiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:aa-chertyanin/git-extended.git
  49383c6..a5c28e7  master -> master
aachernyatin@aachernyatin:~/git-extended$
```

Рисунок 5: Отправка

2.6 git-flow

```
aachernyatin@aachernyatin:~/git-extended$ git flow init
Which branch should be used for bringing forth production releases?
  - master
Branch name for production releases: [master]
Branch name for "next release" development: [develop]

How to name your supporting branch prefixes?
Feature branches? [feature/]
Bugfix branches? [bugfix/]
Release branches? [release/]
Hotfix branches? [hotfix/]
Support branches? [support/]
Version tag prefix? []
Hooks and filters directory? [/home/aachernyatin/git-extended/.git/hooks]
aachernyatin@aachernyatin:~/git-extended$ git branch
* develop
  master
aachernyatin@aachernyatin:~/git-extended$ git push --all
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'develop' on GitHub by visiting:
remote:     https://github.com/aa-chertyanin/git-extended/pull/new/develop
remote:
To github.com:aa-chertyanin/git-extended.git
 * [new branch]      develop -> develop
aachernyatin@aachernyatin:~/git-extended$ █
```

Рисунок 6: Инициализация и загрузка изменений

2.7 git-flow

```
aachernyatin@aachernyatin:~/git-extended$ git branch --set-upstream-to=origin/develop develop
branch 'develop' set up to track 'origin/develop'.
aachernyatin@aachernyatin:~/git-extended$ git flow release start 1.0.0
Switched to a new branch 'release/1.0.0'

Summary of actions:
- A new branch 'release/1.0.0' was created, based on 'develop'
- You are now on branch 'release/1.0.0'

Follow-up actions:
- Bump the version number now!
- Start committing last-minute fixes in preparing your release
- When done, run:

    git flow release finish '1.0.0'

aachernyatin@aachernyatin:~/git-extended$ standard-changelog --first-release
aachernyatin@aachernyatin:~/git-extended$ git add CHANGELOG.md
aachernyatin@aachernyatin:~/git-extended$ git commit -am 'chore(site): add changelog'
[release/1.0.0 41d43db] chore(site): add changelog
1 file changed, 4 insertions(+)
create mode 100644 CHANGELOG.md
aachernyatin@aachernyatin:~/git-extended$ git flow release finish 1.0.0
Switched to branch 'master'
Your branch is up to date with 'origin/master'.
Merge made by the 'ort' strategy.
CHANGELOG.md | 4 +++
1 file changed, 4 insertions(+)
create mode 100644 CHANGELOG.md
Already on 'master'.
Your branch is ahead of 'origin/master' by 2 commits.
(use "git push" to publish your local commits)
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
Merge made by the 'ort' strategy.
CHANGELOG.md | 4 +++
```

Рисунок 7: Завершение релиза

2.8 Отправим данные на github

```
aachernyatin@aachernyatin:~/git-extended$  
aachernyatin@aachernyatin:~/git-extended$ git push --all  
Enumerating objects: 6, done.  
Counting objects: 100% (6/6), done.  
Delta compression using up to 4 threads  
Compressing objects: 100% (4/4), done.  
Writing objects: 100% (5/5), 2.67 KiB | 2.67 MiB/s, done.  
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)  
To github.com:aa-chertyanin/git-extended.git  
  a5c28e7..f289cf8  develop -> develop  
  a5c28e7..ccb5f83  master -> master  
aachernyatin@aachernyatin:~/git-extended$ git push --tags  
Enumerating objects: 1, done.  
Counting objects: 100% (1/1), done.  
Writing objects: 100% (1/1), 158 bytes | 158.00 KiB/s, done.  
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)  
To github.com:aa-chertyanin/git-extended.git  
 * [new tag]          1.0.0 -> 1.0.0  
aachernyatin@aachernyatin:~/git-extended$ gh release create v1.0.0 -F CHANGELOG.md  
https://github.com/aa-chertyanin/git-extended/releases/tag/v1.0.0  
aachernyatin@aachernyatin:~/git-extended$ █
```

Рисунок 8: Отправка

2.9 Объединение веток

```
aachernyatin@aachernyatin:~/git-extended$ git flow feature start feature_branch
aachernyatin@aachernyatin:~/git-extended$ git flow feature start feature_branch
Switched to a new branch 'feature/feature_branch'

Summary of actions:
- A new branch 'feature/feature_branch' was created, based on 'develop'
- You are now on branch 'feature/feature_branch'

Now, start committing on your feature. When done, use:

    git flow feature finish feature_branch

aachernyatin@aachernyatin:~/git-extended$ touch test2
aachernyatin@aachernyatin:~/git-extended$ git flow feature finish feature_branch
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
Already up to date.
Deleted branch feature/feature_branch (was f289cf8).

Summary of actions:
- The feature branch 'feature/feature_branch' was merged into 'develop'
- Feature branch 'feature/feature_branch' has been locally deleted
- You are now on branch 'develop'

aachernyatin@aachernyatin:~/git-extended$
```

Рисунок 9: Объединение веток

2.10 git-flow

```
package.json | 2 +-  
2 files changed, 5 insertions(+), 1 deletion(-)  
Deleted branch release/1.2.3 (was 8576694).  
  
Summary of actions:  
- Release branch 'release/1.2.3' has been merged into 'master'  
- The release was tagged '1.2.3'  
- Release tag '1.2.3' has been back-merged into 'develop'  
- Release branch 'release/1.2.3' has been locally deleted  
- You are now on branch 'develop'  
  
aachernyatin@aachernyatin:~/git-extended$ git push --all  
Enumerating objects: 9, done.  
Counting objects: 100% (9/9), done.  
Delta compression using up to 4 threads  
Compressing objects: 100% (6/6), done.  
Writing objects: 100% (6/6), 2.78 KiB | 2.78 MiB/s, done.  
Total 6 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)  
remote: Resolving deltas: 100% (1/1), completed with 1 local object.  
To github.com:aa-chertyanin/git-extended.git  
    f289cf8..3f930df develop -> develop  
    ccb5f83..d8efb88 master -> master  
aachernyatin@aachernyatin:~/git-extended$ git push --tags  
Enumerating objects: 1, done.  
Counting objects: 100% (1/1), done.  
Writing objects: 100% (1/1), 157 bytes | 157.00 KiB/s, done.  
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)  
To github.com:aa-chertyanin/git-extended.git  
  * [new tag]      1.2.3 -> 1.2.3  
aachernyatin@aachernyatin:~/git-extended$ gh release create v1.2.3 -F CHANGELOG.md  
https://github.com/aa-chertyanin/git-extended/releases/tag/v1.2.3  
aachernyatin@aachernyatin:~/git-extended$
```

Рисунок 10: Завершение релиза

2.11 Подготовка рабочего репозитория

```
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ gedit package.json
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ git add .
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ git cz
cz-cli@4.3.1, cz-conventional-changelog@3.3.0

? Select the type of change that you're committing: chore: Other changes that don't modify src or test files
? What is the scope of this change (e.g. component or file name): (press enter to skip)
? Write a short, imperative tense description of the change (max 93 chars):
(4) test
    "
? Provide a longer description of the change: (press enter to skip)

? Are there any breaking changes? No
? Does this change affect any open issues? No
[master dbc5136] chore: test
  1 file changed, 11 insertions(+), 11 deletions(-)
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ git push
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 1.10 KiB | 1.10 MiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:aa-chertyanin/os-intro.git
  281fdf2..dbc5136  master -> master
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ █
```

Рисунок 11: package.json и коммит

2.12 Подготовка рабочего репозитория

```
Already on 'master'
Your branch is ahead of 'origin/master' by 2 commits.
  (use "git push" to publish your local commits)
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
Merge made by the 'ort' strategy.
  CHANGELOG.md | 10 ++++++++-
  1 file changed, 10 insertions(+)
  create mode 100644 CHANGELOG.md
Deleted branch release/1.0.0 (was 33aec2e).

Summary of actions:
- Release branch 'release/1.0.0' has been merged into 'master'
- The release was tagged 'v1.0.0'
- Release tag 'v1.0.0' has been back-merged into 'develop'
- Release branch 'release/1.0.0' has been locally deleted
- You are now on branch 'develop'

aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ git push --all
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 2.79 KiB | 2.79 MiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:aa-chertyanin/os-intro.git
  dbc5136..f3682ba  develop -> develop
  dbc5136..539e89d  master -> master
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$ git push --tags
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 159 bytes | 159.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:aa-chertyanin/os-intro.git
 * [new tag]      v1.0.0 -> v1.0.0
aachernyatin@aachernyatin:~/work/study/2025-2026/Операционные системы/os-intro$
```

Рисунок 12: Завершение релиза

3. Выводы по проделанной работе

3.1 Вывод

Мы приобрели практические навыки взаимодействия с дополнительными функциями гитхаб.