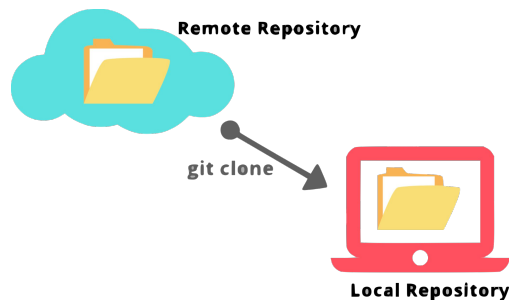


# 第七章 克隆(cloning) + 拉取(Fetching)



# 内容大纲

## 1. 模拟两人协作开发

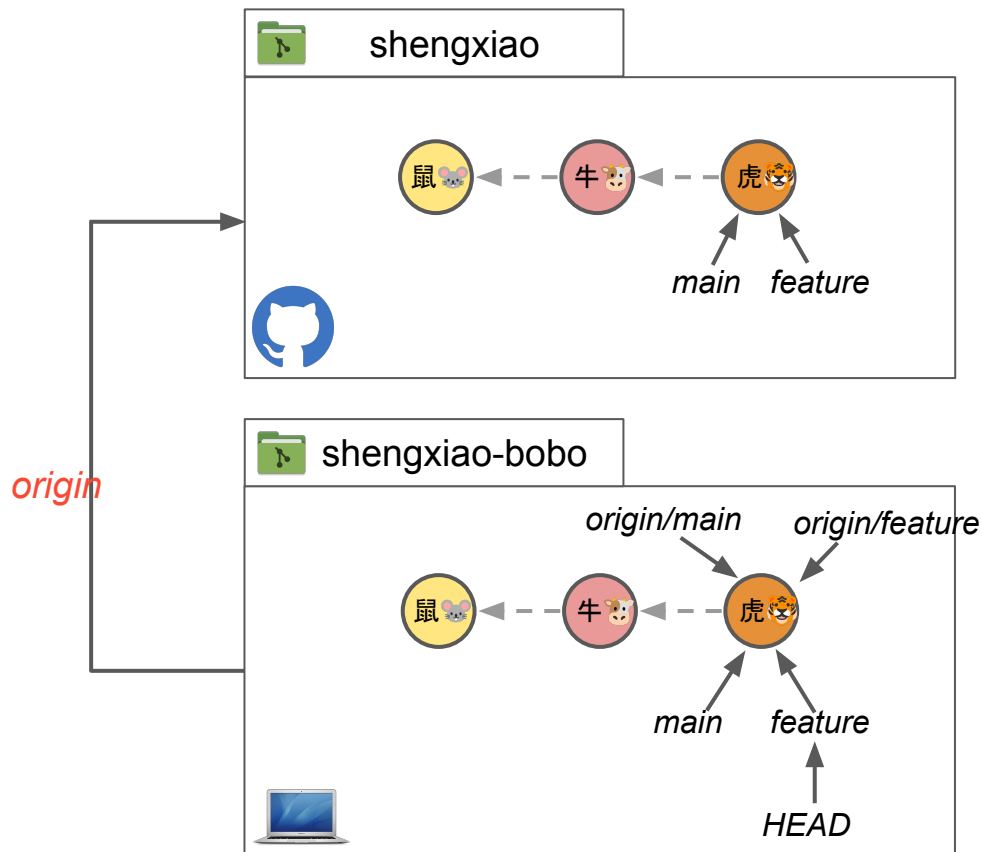
- a. [张三]克隆(cloning)远程仓库(自动关联上游分支)
- b. [张三]如何删除远程+本地分支
- c. [张三]新提交+push到远程仓库
- d. [波波]从远程仓库拉取(fetching)数据

## 2. 两集

- a. 上~张三clone/delete/commit/push
- b. 下~波波fetch/merge

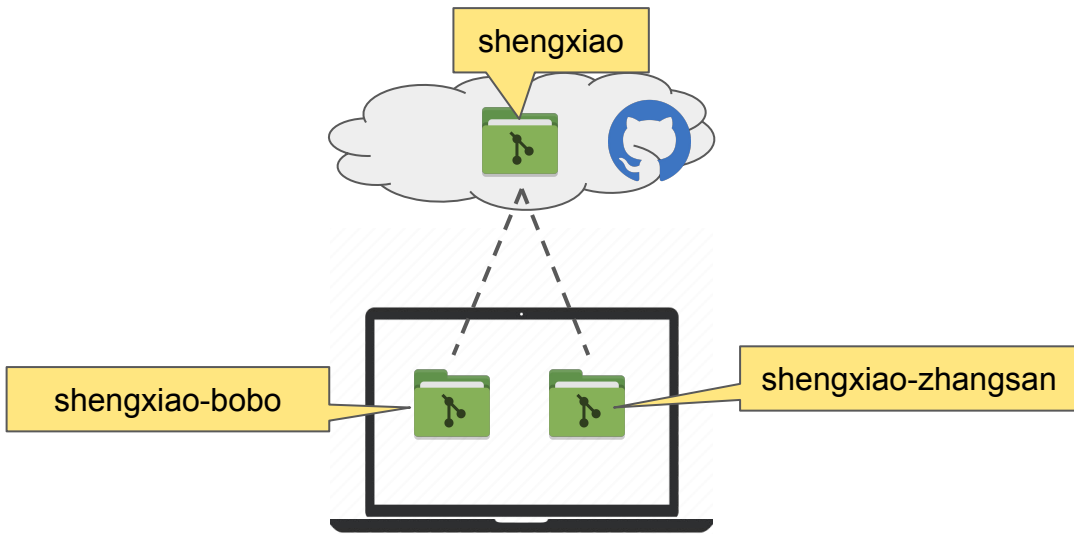


# 目前本地和 远程仓库情况



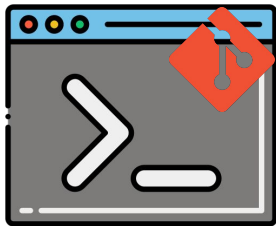
# 模拟两人协作开发

- 两个协作者，每个都有自己的本地仓库，每个将代码贡献到远程仓库
- 本课程使用同一台计算机的两个不同目录来模拟两个本地仓库
  - shengxiao-bobo vs shengxiao-zhangsan
- 建议：
  - 两个IDE+终端窗口



# 命令～克隆远程仓库

- ***git clone <URL> <directory\_name>***
  - 步骤
    - 在当前目录中创建一个项目目录
    - 初始化一个本地仓库
    - 从远程仓库下载所有的数据
    - 在本地和远程仓库之间建立一个连接(缺省shortname是origin)
  - 注意, 如果不指定 `directory_name`, 那么将采用远程的项目目录名



# 实操～克隆远程项目

## 0. 切换目录

```
bilibili — boboweike@bobos-Mac — ...-git/bilibili — zsh — 48x5
→ bilibili pwd
/Users/boboweike/mydemo/2024/learn-git/bilibili
→ bilibili
```

1

## 1. git clone

```
prep — boboweike@bobos-Mac — ...earn-git/ — zsh — 80x11
→ prep git clone https://github.com/bytevigor/shengxiao.git shengxiao-zhangsan
Cloning into 'shengxiao-zhangsan'...
remote: Enumerating objects: 9, done.
remote: Counting objects: 100% (9/9), done.
remote: Compressing objects: 100% (4/4), done.
remote: Total 9 (delta 1), reused 9 (delta 1), pack-reused 0 (from 0)
Receiving objects: 100% (9/9), done.
Resolving deltas: 100% (1/1), done.
→ prep
```

## 2 git remote -v

```
shengxiao-zhangsan — boboweike@bobos-Mac — ...xiao-zhangsan — zsh — 62x7
→ prep cd shengxiao-zhangsan
→ shengxiao-zhangsan git:(main) ls
12_shengxiao.txt
→ shengxiao-zhangsan git:(main) git remote -v
origin https://github.com/bytevigor/shengxiao.git (fetch)
origin https://github.com/bytevigor/shengxiao.git (push)
→ shengxiao-zhangsan git:(main)
```

## 3 git branch --all

```
shengxiao-zhangsan — git branch --all — git — less — git branch --all — 42x7
* main
  remotes/origin/HEAD -> origin/main
  remotes/origin/feature
  remotes/origin/main
~
~
(END)
```

## 4 git log

```
shengxiao-zhangsan — git log — git — less — git log — 88x23
commit 9508fc1f62ab16bcb32654bf448c9e53f23
e5d72 (HEAD -> main, origin/main, origin/feature, origin/HEAD)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 15:27:26 2024 +0800

虎

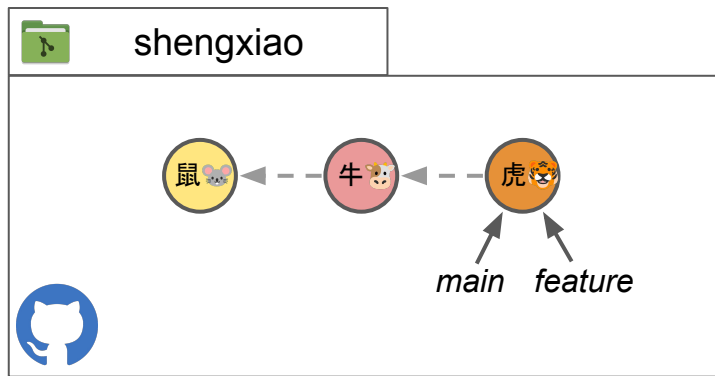
commit 779dcccdfacf279ce53993d46518a666e29a7007
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

牛

commit 52d496d246c90b0ba13a1b25b5060af2f73dedad
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 09:43:56 2024 +0800

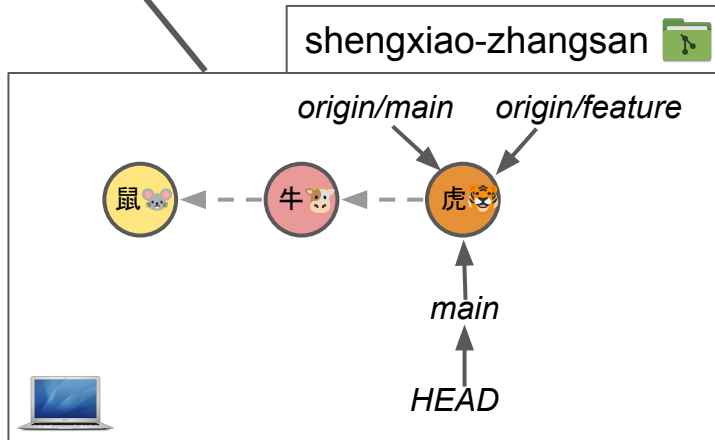
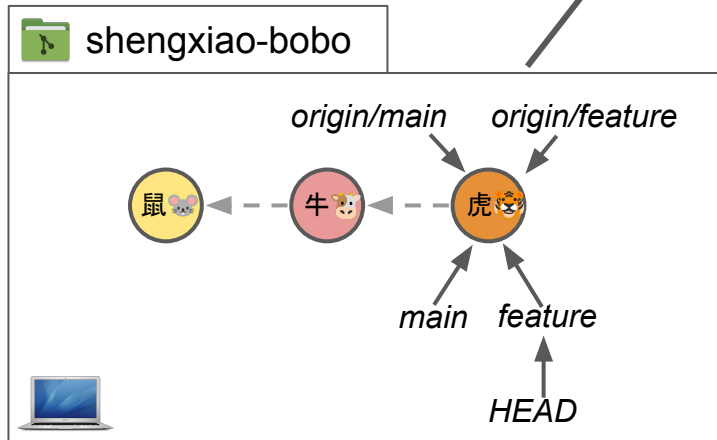
~
~
(END)
```

# 目前本地和 远程仓库情况



origin

origin



# 说明

- **origin/HEAD**指向当前所在分支(main)
- 克隆项目shengxiao-zhangsan自动具有缺省  
shortname ~ **origin**
  - 不需要使用命令 `git remote add <shortname> <URL>`
- shengxiao-bobo项目当前分支为  
feature, shengxiao-zhangsan项目当前分支为  
main,
- shengxiao-zhangsan中没有本地feature, 但有  
远程跟踪分支feature



```
1 [core]
2   repositoryformatversion = 0
3   filemode = true
4   bare = false
5   logallrefupdates = true
6   ignorecase = true
7   precomposeunicode = true
8 [remote "origin"]
9   url = https://github.com/bytevigor/shengxiao.git
10  fetch = +refs/heads/*:refs/remotes/origin/*
11 [branch "main"]
12   remote = origin
13   merge = refs/heads/main
14   vscode-merge-base = origin/main
15
```



# 操作～将shengxiao-zhangsan切换到feature分支

## 切换分支git switch feature

```
shengxiao-zhangsan — boboweike@bobos-Mac — ..xiao-zhangsan — -zsh — 62x6
→ shengxiao-zhangsan git:(main) git switch feature
branch 'feature' set up to track 'origin/feature'.
Switched to a new branch 'feature'
→ shengxiao-zhangsan git:(feature)
```

## 切换前git branch --all

BEFORE

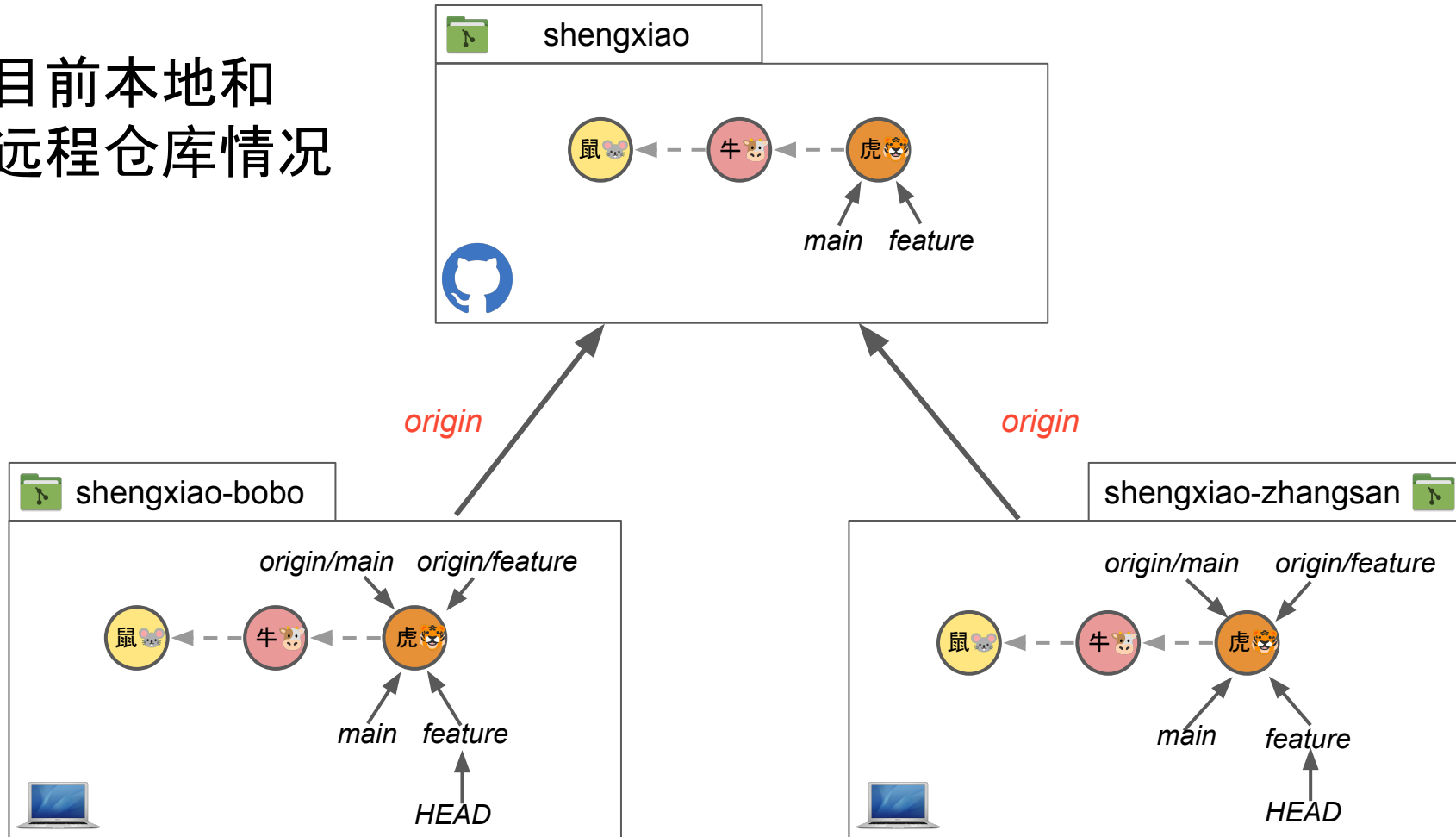
```
shengxiao-zhangsan — git branch --all — git — less — git branch --all — 67x7
* main
  remotes/origin/HEAD -> origin/main
  remotes/origin/feature
  remotes/origin/main
~
~
(END)
```

## 切换后git branch --all

AFTER

```
shengxiao-zhangsan — git branch --all — git — less — git branch --all — 62x6
* feature
  main
  remotes/origin/HEAD -> origin/main
  remotes/origin/feature
  remotes/origin/main
(END)
```

# 目前本地和 远程仓库情况





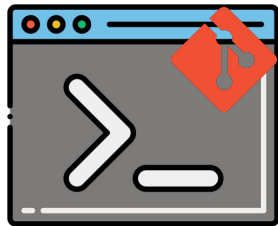
## 说明 ~ 删除分支

- 目的: 保持项目结构清晰
- 删除某个分支前, 需确保:
  - 该分支上的新内容已经被合并到另外一个分支
  - 或者已不需要该分支上的新内容
- 如果删除了一个包含新提交的分支, 这些新提交并不会被删除, 它们仍然在提交历史中, 只是没有易于访问的分支引用
- 要完全删除一个分支, 需要同时删除:
  - 远程分支(remote branch)
  - 远程跟踪分支(remote-tracking branch)
  - 本地分支(local branch)

# 命令～删除分支

- ***git push <shortname> -d <branch\_name>***
  - 删除一个远程分支和相关联的远程跟踪分支
  - 也可以GitHub界面操作, 但是并不删除远程跟踪分支
- ***git branch -d <branch\_name>***
  - 删除一个本地分支

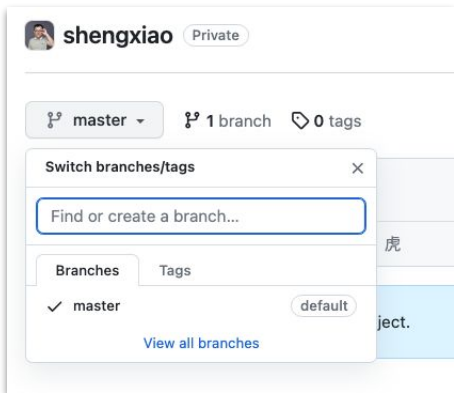
注意: 删除某个本地分支前需切换到另外一个本地分支



# 实操1 ~ 删除远程分支

git push origin -d feature

```
shengxiao-zhangsan — boboweike@bobos-Mac — .xiao-zhangsan — -zsh — 65x6
→ shengxiao-zhangsan git:(feature) git push origin -d feature
To https://github.com/boboweike/shengxiao
- [deleted]      feature
→ shengxiao-zhangsan git:(feature)
```



删除前git branch --all

BEFORE

```
shengxiao-zhangsan — git branch --all — git — less — git branch --all — 62x6
* feature
main
remotes/origin/HEAD -> origin/main
remotes/origin/feature
remotes/origin/main
(END)
```

删除后git branch --all

AFTER

```
shengxiao-zhangsan — git branch --all — git — less — git branch --all — 65x7
* feature
main
remotes/origin/HEAD -> origin/main
remotes/origin/main
~
~
(END)
```

## 实操2 ~ 删除本地分支

1

git switch main

```
shengxiao-zhangsan — boboweike@bobos-Mac — ..xiao-zhangsan — -zsh — 55x7
→ shengxiao-zhangsan git:(feature) git switch main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
→ shengxiao-zhangsan git:(main)
```

2

git branch -d feature

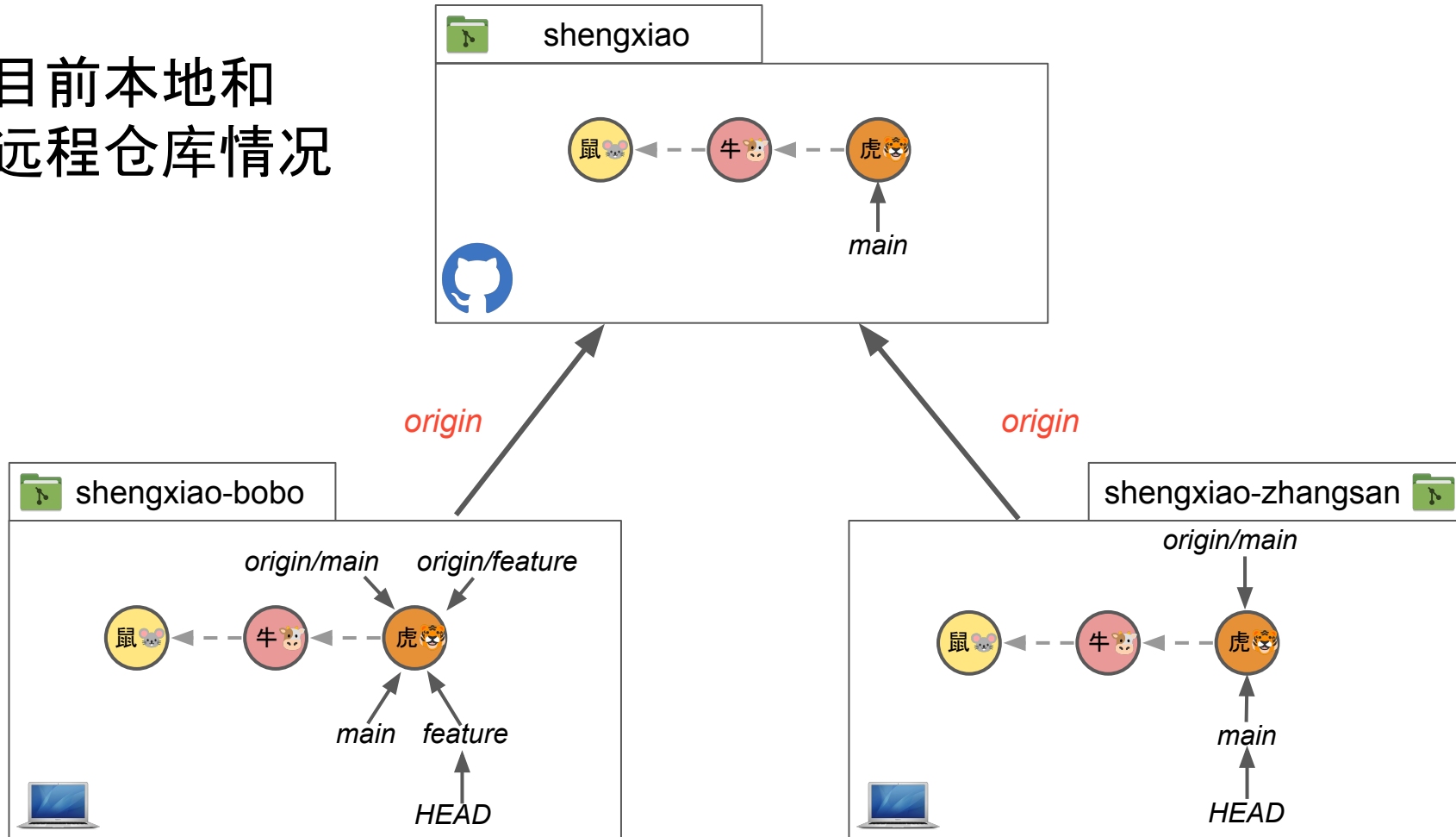
```
shengxiao-zhangsan — boboweike@bobos-Mac — ..xiao-zhangsan — -zsh — 57x5
→ shengxiao-zhangsan git:(main) git branch -d feature
Deleted branch feature (was 117c366).
→ shengxiao-zhangsan git:(main)
```

3

git branch --all

```
shengxiao-zhangsan — git branch --all — git — less — git branch --all — 57x6
* main
remotes/origin/HEAD -> origin/main
remotes/origin/main
~
~
(END)
```

# 目前本地和 远程仓库情况



# 实操～张三添加第四个生肖龙

2

```
shengxiao-zhangsan git:(main) * git status
On branch main
Your branch is up to date with 'origin/main'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
    modified:   12_shengxiao.txt

no changes added to commit (use "git add" and/or "git commit -a")
shengxiao-zhangsan git:(main) * git add 12_shengxiao.txt
shengxiao-zhangsan git:(main) * git commit -m "龙"
[main ae07260] 龙
1 file changed, 1 insertion(+), 1 deletion(-)
shengxiao-zhangsan git:(main) *
```

3

git log

```
shengxiao-zhangsan - git log - git --less - git log --78x10
commit ae0726079d29818f7cfe7169f54020fd84d149a0 (HEAD -> main)
Author: bobo <bobo@boboweike.cn>
Date: Wed Oct 16 12:09:47 2024 +0800

    龙

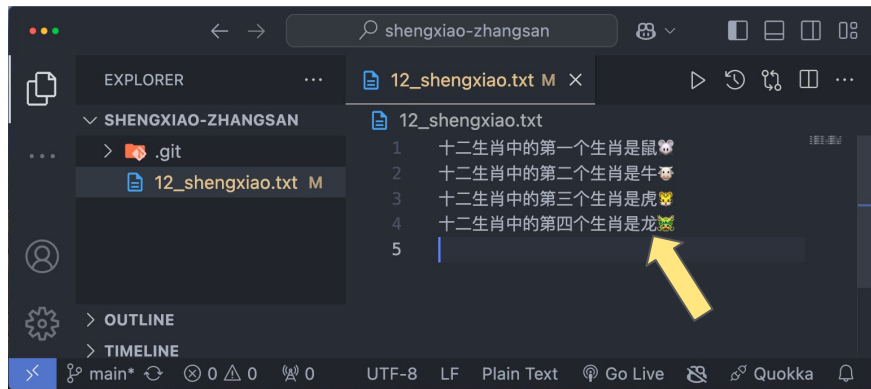
commit 9508fc1f62ab16bcb32654bf448c9e53f23e5d72 (origin/main, origin/HEAD)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 15:27:26 2024 +0800

    虎

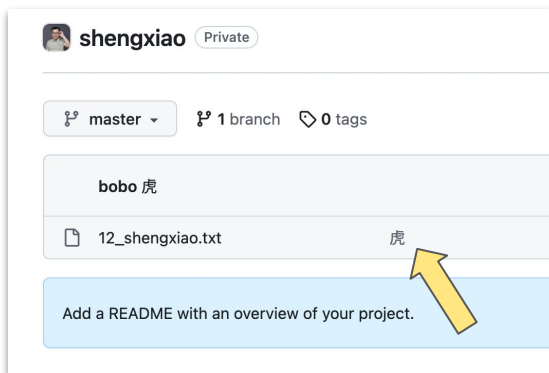
commit 779dcdcfacdf279ce53993d46518a666e29a7007
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

    牛
```

1

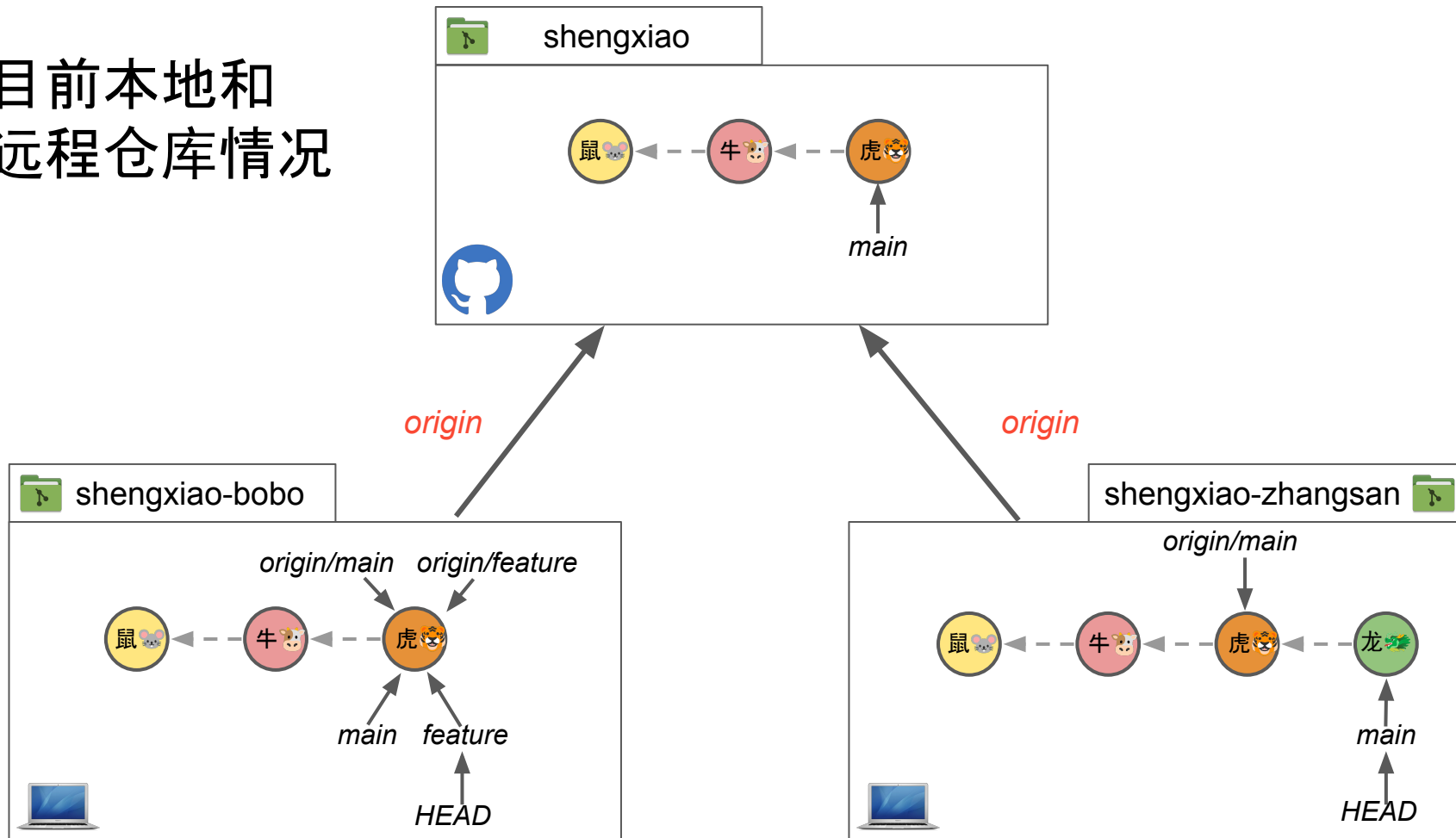


4





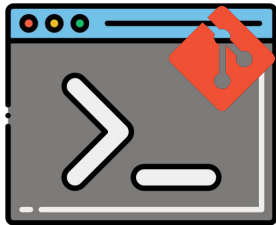
# 目前本地和 远程仓库情况



# 命令 ~ 查看本地和上游分支关系

- ***git branch -vv***
  - 列出本地分支是否定义了上游分支
  - 同时显示本地是提前还是落后于上游分支

- 建立上游分支关系后，git push命令不需要传额外参数
- 如果本地仓库是从远程clone的，那么上游分支关系会自动建立



# 实操～查看上游分支关系

git branch -vv

1

```
shengxiao-zhangsan — git branch -vv — git — less · git branch -vv — 45x5
* main ae07260 [origin/main: ahead 1] 龙
~
~
~
(END)
```

2

```
shengxiao-zhangsan — boboweike@bobos-Mac — .xiao-zhangsan — zsh — 53x7
→ shengxiao-zhangsan git:(main) git status
On branch main
Your branch is ahead of 'origin/main' by 1 commit.
(use "git push" to publish your local commits)

nothing to commit, working tree clean
→ shengxiao-zhangsan git:(main)
```

# 实操 ~ 张三将本地分支推到远程仓库

```
shengxiao-zhangsan -- boboweike@bobos-Mac -- .xiao-zhangsan -- -zsh -- 71x17
→ shengxiao-zhangsan git:(main) git push
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 10 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 297 bytes | 297.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/bytevigor/shengxiao.git
  9508fc1..ae07260  main -> main
→ shengxiao-zhangsan git:(main) git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
→ shengxiao-zhangsan git:(main)
```

```
shengxiao-zhangsan -- git log -- git -- less -- git log -- 71x17
commit ae0726079d29818f7cfe7169f54020fd84d149a0 (HEAD -> main, origin/main, origin/HEAD)
Author: bobo <bobo@boboweike.cn>
Date:   Wed Oct 16 12:09:47 2024 +0800

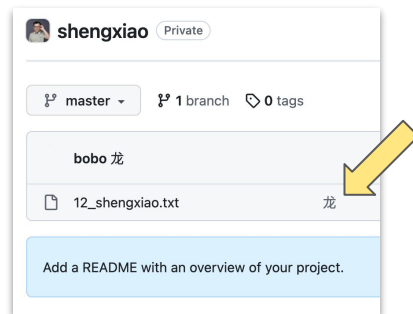
    龙

commit 9508fc1f62ab16bcb32654bf448c9e53f23e5d72
Author: bobo <bobo@boboweike.cn>
Date:   Sun Oct 13 15:27:26 2024 +0800

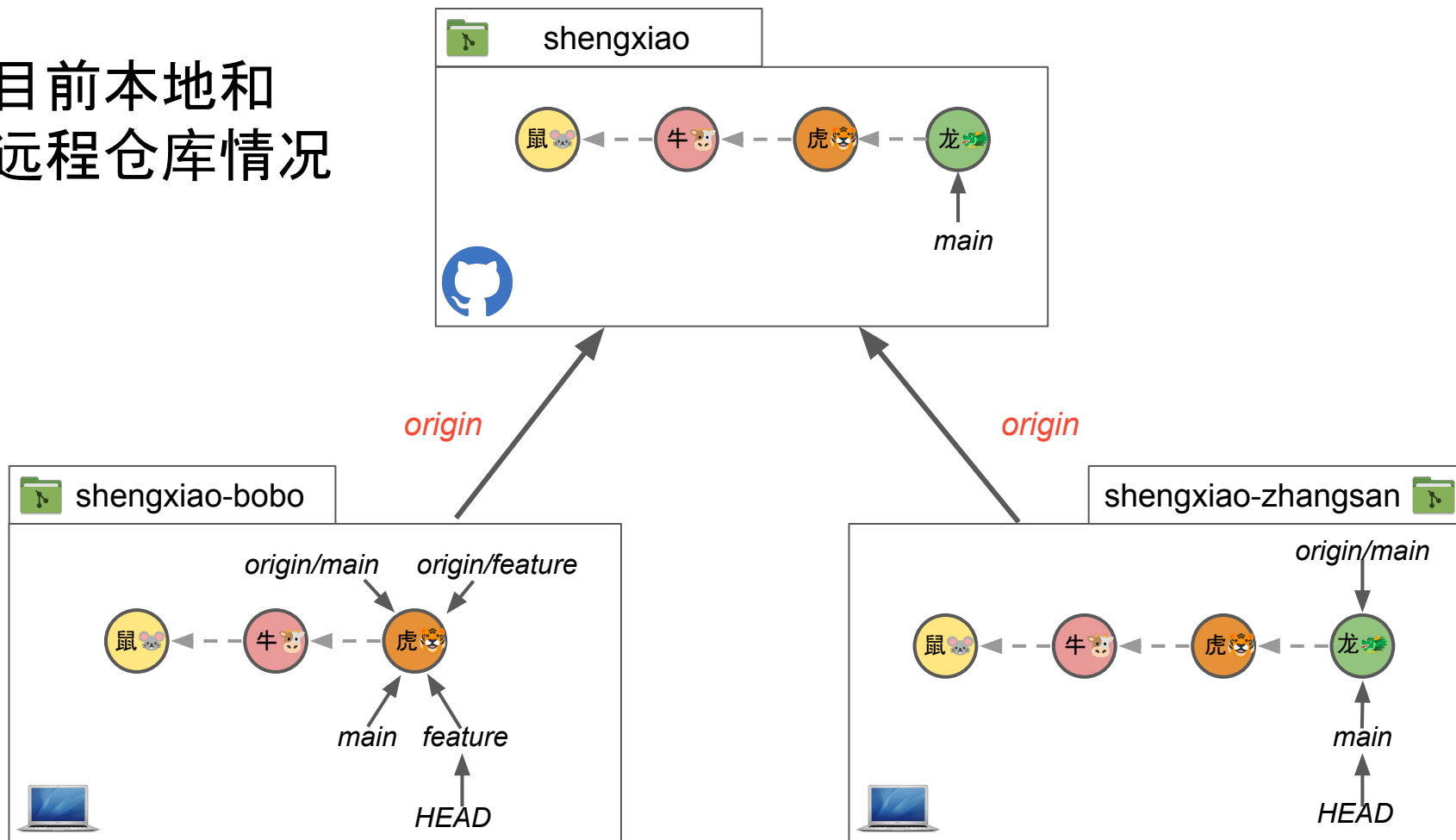
    虎

commit 779dcccdfacdf279ce53993d46518a666e29a7007
Author: bobo <bobo@boboweike.cn>
Date:   Sun Oct 13 13:23:39 2024 +0800

    :
```



# 目前本地和 远程仓库情况



## 步骤 ~ 将远程分支的变更集成到本地

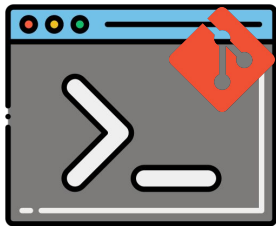
1. 从远程分支拉取(fetch)变更
2. 将变更集成到本地分支



# 命令 ~ 从远程分支拉取变更

- ***git fetch <shortname>***
  - 从和<shortname>对应的远程仓库拉取数据
- ***git fetch***
  - 从和shortname **origin**对应的远程仓库拉取数据

**git fetch**只影响远程跟踪分支, 并不影响本地分支 (并不自动集成进本地)



# 实操 ~ fetch远程变更到shengxiao-bobo本地仓库

切换到  
shengxiao-bobo

```
shengxiao-bobo — boboweike@bobs-Mac — ..hengxiao-bobo — -zsh — 42x5
→ shengxiao-bobo git:(feature)
```

1

## 1. git log --all

```
shengxiao-bobo — git log — git — less — git log — 71x17
commit 9508fc1f62ab16bcb32654bf448c9e53f23e5d72 (HEAD -> feature, origin/main, origin/feature, main)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 15:27:26 2024 +0800

    虎

commit 779dccdfacdf279ce53993d46518a666e29a7007
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

    牛

commit 52d496d246c90b0ba13a1b25b5060af2f73dedad
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 09:43:56 2024 +0800

:
```

2

## 2. git fetch

```
shengxiao-bobo — boboweike@bobs-Mac — ..hengxiao-bobo — -zsh — 68x10
→ shengxiao-bobo git:(feature) git fetch
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (1/1), done.
remote: Total 3 (delta 1), reused 3 (delta 1), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 277 bytes | 92.00 KiB/s, done.
From https://github.com/bytevigor/shengxiao
  9508fc1..ae07260  main      -> origin/main
→ shengxiao-bobo git:(feature)
```

3

## 3. git log --all

```
shengxiao-bobo — git log --all — git — less — git log --all — 68x20
commit ae0726079d29818f7cfe7169f54020fd84d149a0 (origin/main)
Author: bobo <bobo@boboweike.cn>
Date: Wed Oct 16 12:09:47 2024 +0800

    龙

commit 9508fc1f62ab16bcb32654bf448c9e53f23e5d72 (HEAD -> feature, origin/main, origin/feature, main)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 15:27:26 2024 +0800

    虎

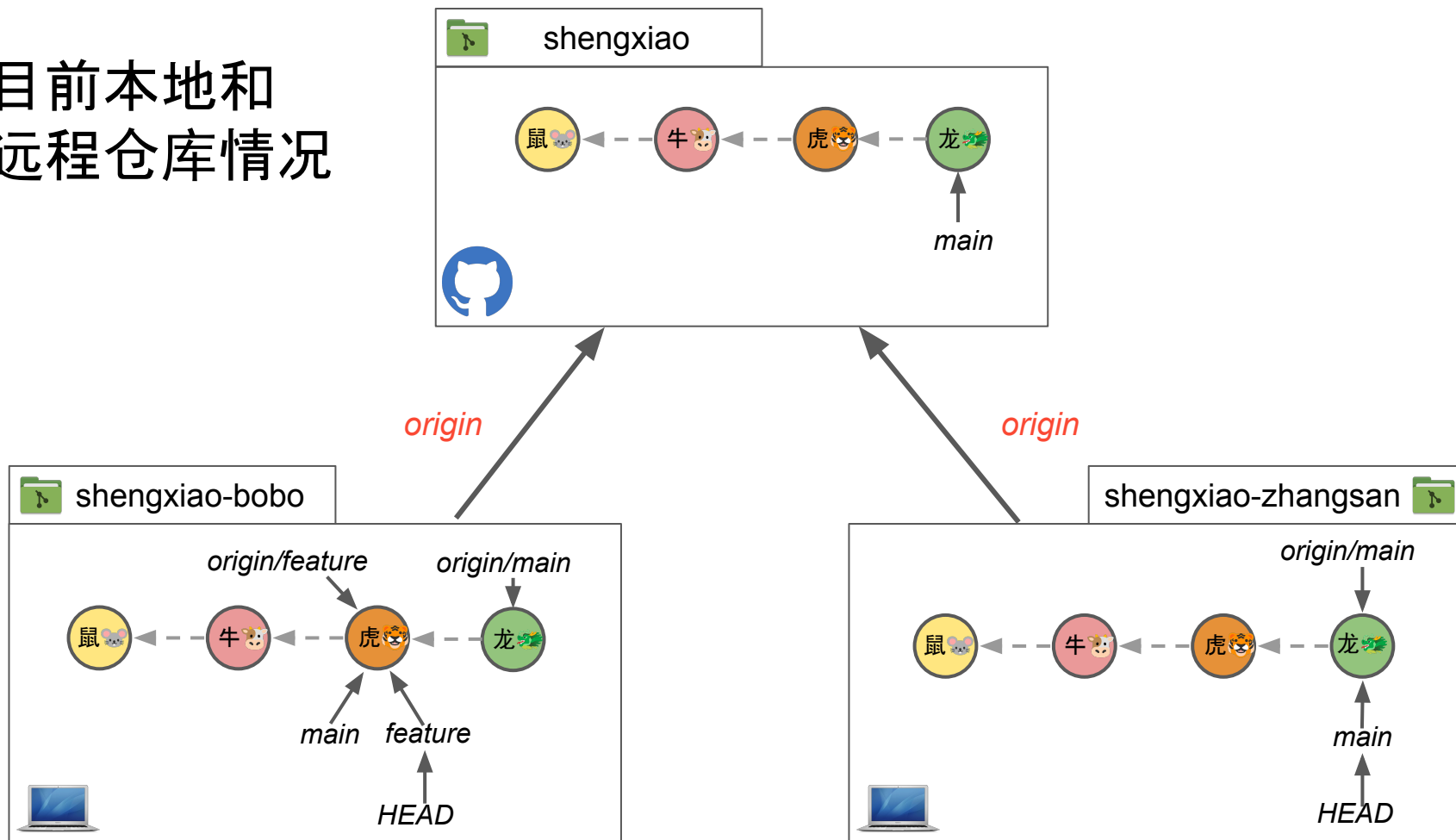
commit 779dccdfacdf279ce53993d46518a666e29a7007
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

    牛

:
```



# 目前本地和 远程仓库情况



# 集成变更到本地分支(复习)



- 两种集成方式
  - 合并(merging)
  - 变基(rebasing)
- 两种合并方式
  - 快进合并(fast-forward merge)
  - 三路合并(three-way merge)
- 下一步
  - 将origin/main远程分支合并到本地 main 分支(shengxiao-bobo)
  - 也是属于 快进合并
  - 需要先切换到目标分支(main)

# 实操 ~ 集成变更到本地分支

1

## 1. git switch + git merge

```
shengxiao-bobo → boboweike@bobos-Mac ~ .hengxiao-bobo -- zsh -- 61x9
→ shengxiao-bobo git:(feature) git switch main
Switched to branch 'main'
→ shengxiao-bobo git:(main) git merge origin/main
Updating 9508fc1..ae07260
Fast-forward
 12_shengxiao.txt | 2 +--
 1 file changed, 1 insertion(+), 1 deletion(-)
→ shengxiao-bobo git:(main)
```

2

## 2. git log

```
shengxiao-bobo — git log — git — less · git log — 75x20
commit ae0726079d29818f7cfe7169f54020fd84d149a0 (HEAD -> main, origin/main)
Author: bobo <bobo@boboweike.cn>
Date: Wed Oct 16 12:09:47 2024 +0800

    龙

commit 9508fc1f62ab16bcb32654bf448c9e53f23e5d72 (origin/feature, feature)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 15:27:26 2024 +0800

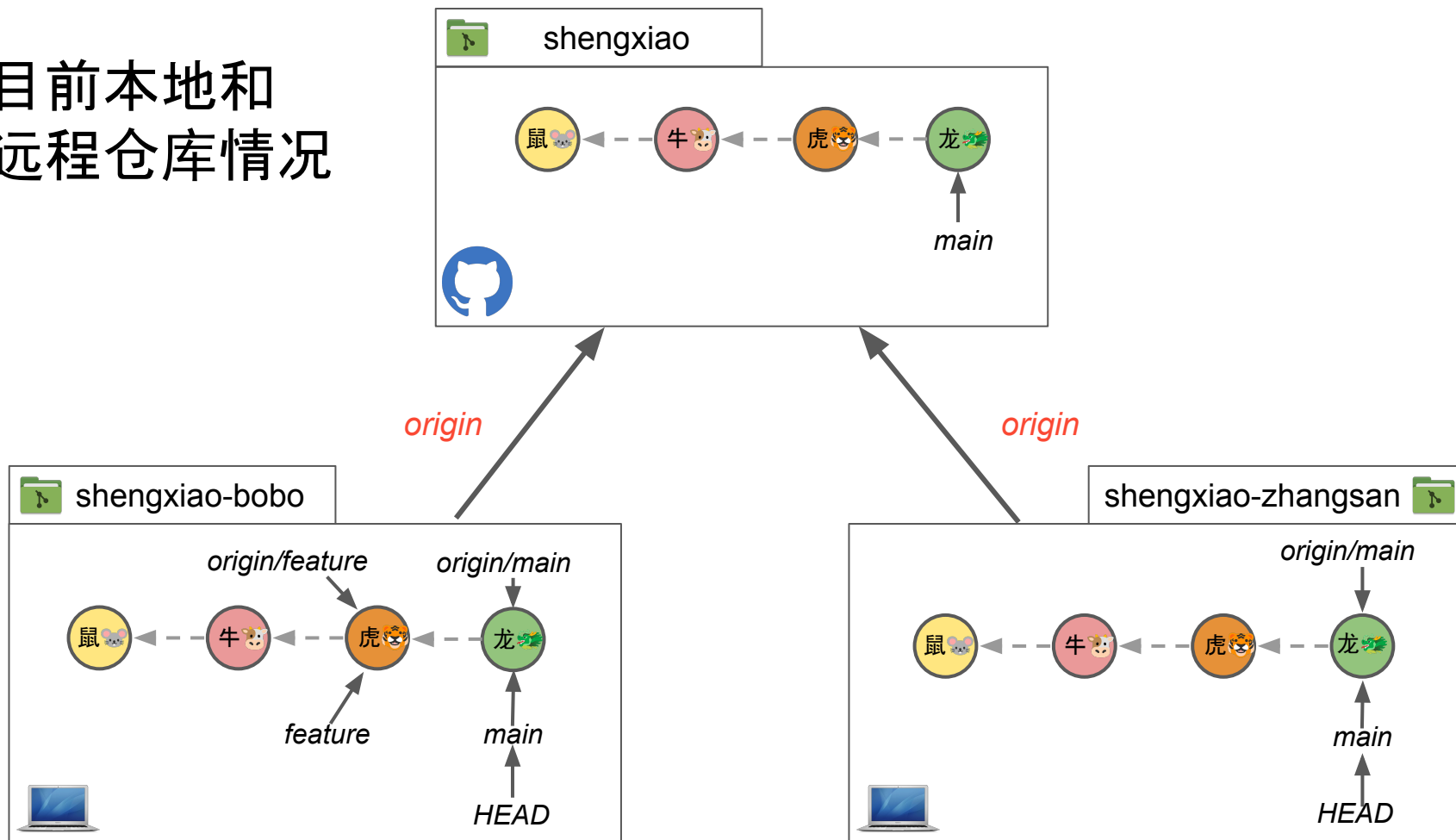
    虎

commit 779dcccdfacdf279ce53993d46518a666e29a7007
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

    牛

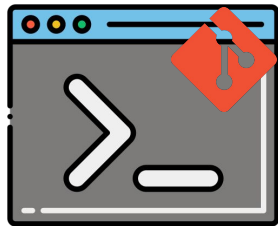
:
```

# 目前本地和 远程仓库情况



# 命令 ~ 删除远程跟踪分支

- ***git fetch -p***
  - 删除本地的远程跟踪分支, 其在远程仓库中对应的分支已经被删除
  - **-p**表示prune(修剪)



# 实操 ~ 删除远程跟踪分支 origin/feature

1

1. git branch --all



```
shengxiao-bobo — git branch --all — git — less • git branch --all — 39x6
feature
* main
  remotes/origin/feature
  remotes/origin/main
~
(END)
```

2

2. git fetch -p



```
shengxiao-bobo — boboweike@bobos-Mac — ..hengxiao-bobo — zsh — 48x5
→ shengxiao-bobo git:(main) git fetch -p
From https://github.com/bytevigor/shengxiao
- [deleted]          (none)      -> origin/feature
e
→ shengxiao-bobo git:(main)
```

3

3. git branch --all



```
shengxiao-bobo — git branch --all — git — less • git branch --all — 36x6
feature
* main
  remotes/origin/main
~
~
~
(END)
```

# 实操 ~ 删除本地feature分支

1

1. git branch -d



```
shengxiao-bobo — boboweike@bobos-Mac — ..hengxiao-bobo — -zsh — 57x5
→ shengxiao-bobo git:(main) git branch -d feature
Deleted branch feature (was 9508fc1).
→ shengxiao-bobo git:(main)
```

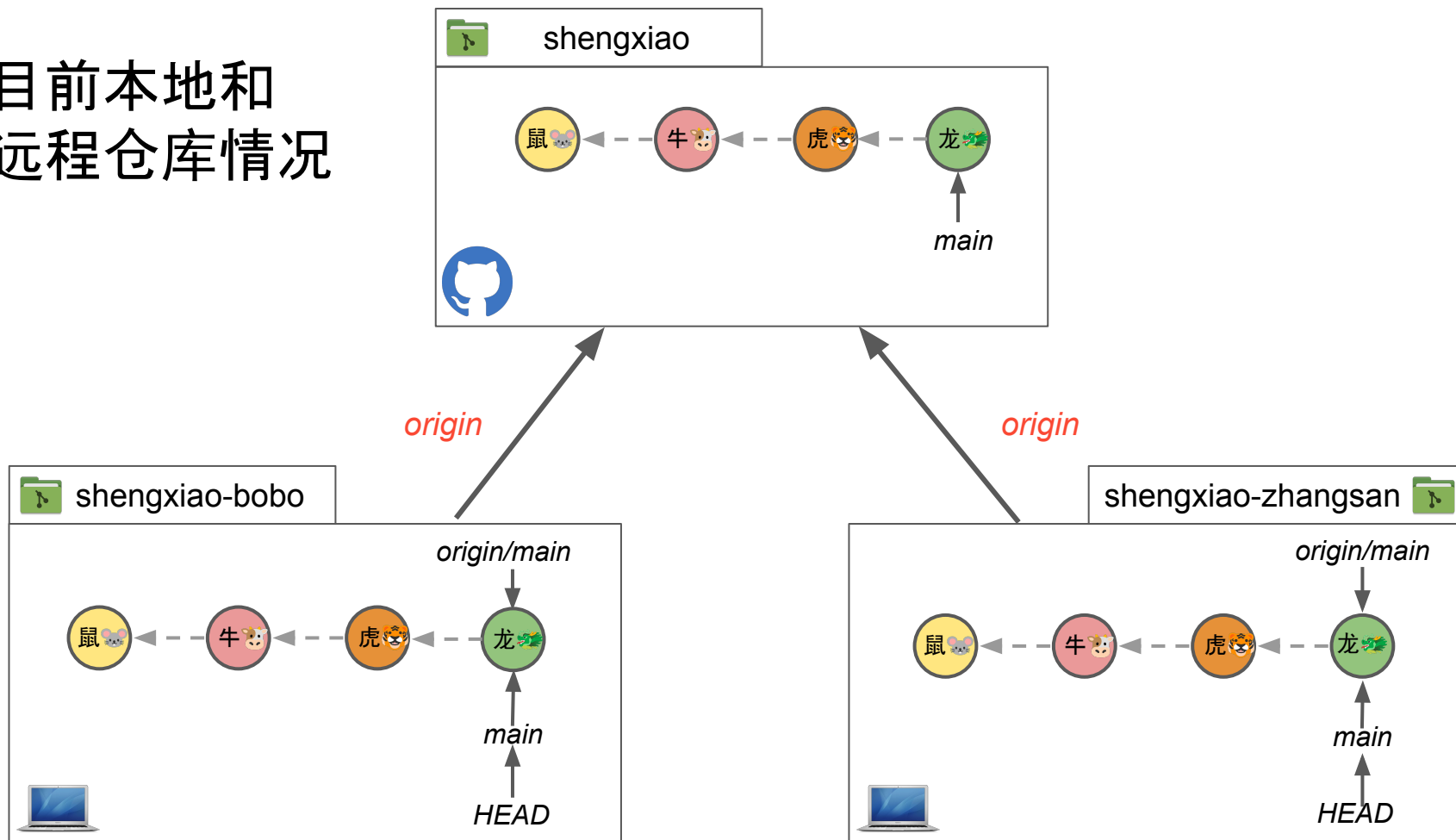
2

2. git branch --all



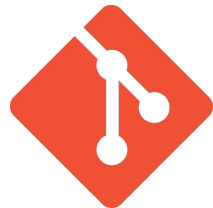
```
shengxiao-bobo — git branch --all — git — less — git br...
* main
remotes/origin/main
~
~
(END)
```

# 目前本地和 远程仓库情况





# 小结和预告



- 本课小结

- 模拟两人协作开发
- 张三克隆了远程仓库shengxiao, 到本地仓库shengxiao-zhangsan
  - 克隆时自动设置shortname为origin
- 张三添加并提交生肖 龙, 并将变更推到远程仓库
- 波波(shengxiao-bobo)集成张三的变更
  - 从远程获取fetch张三的变更
  - 将变更集成到本地分支(快进合并)

- 下一课

- 三路合并(three way merge)