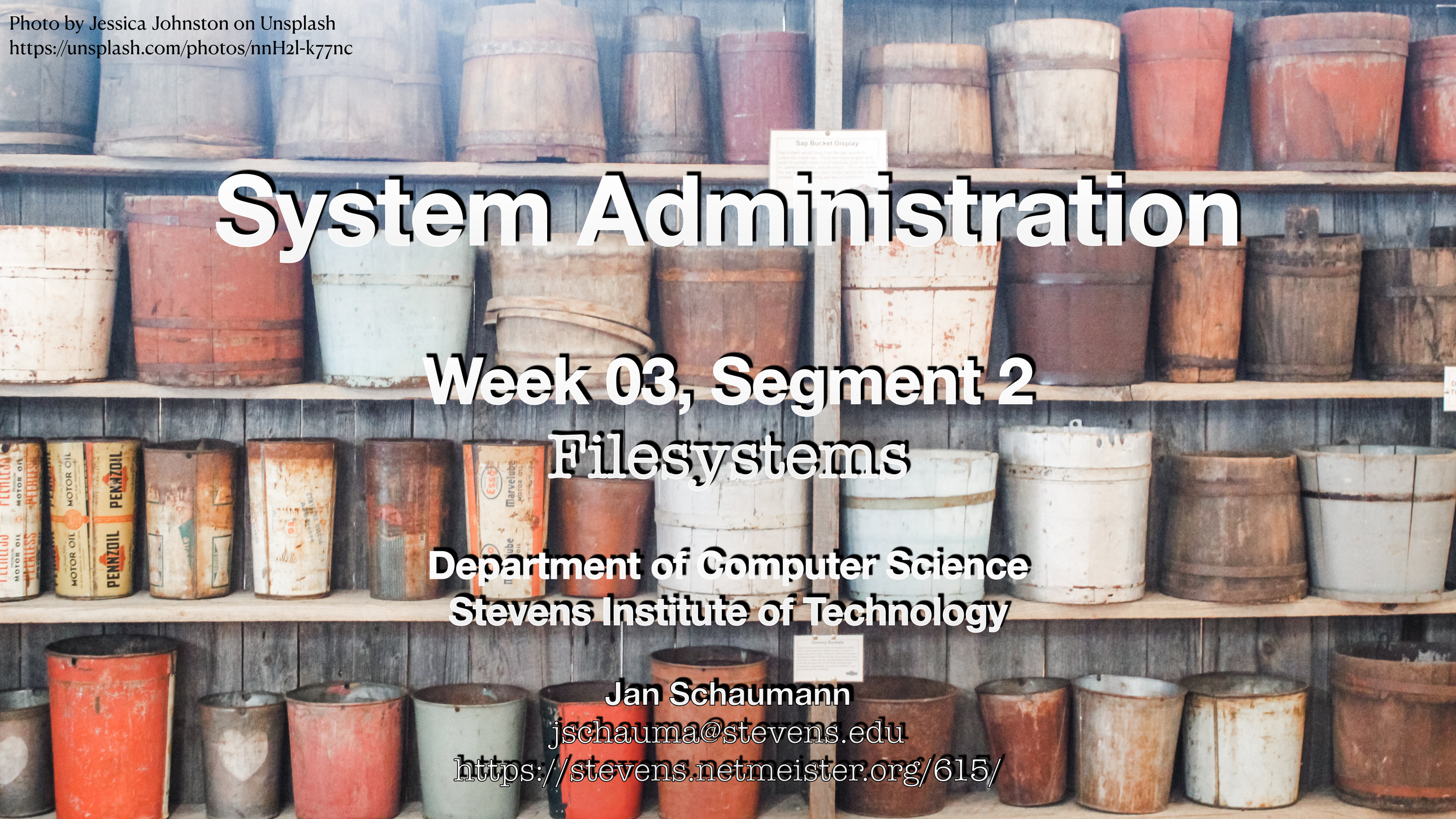


# System Administration

## Week 03, Segment 2
## Filesystems

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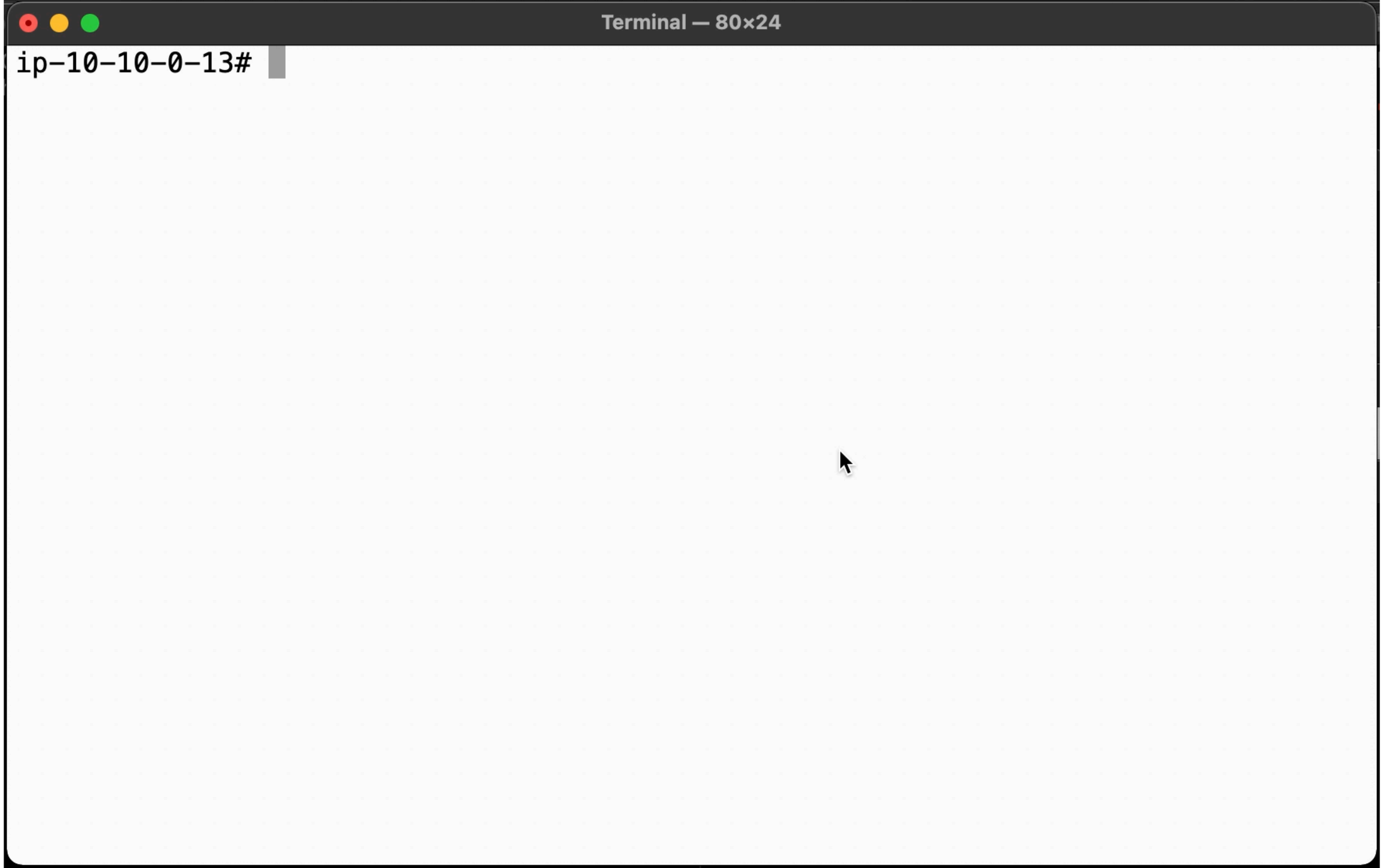
# Let’s pretend we’re a filesystem…

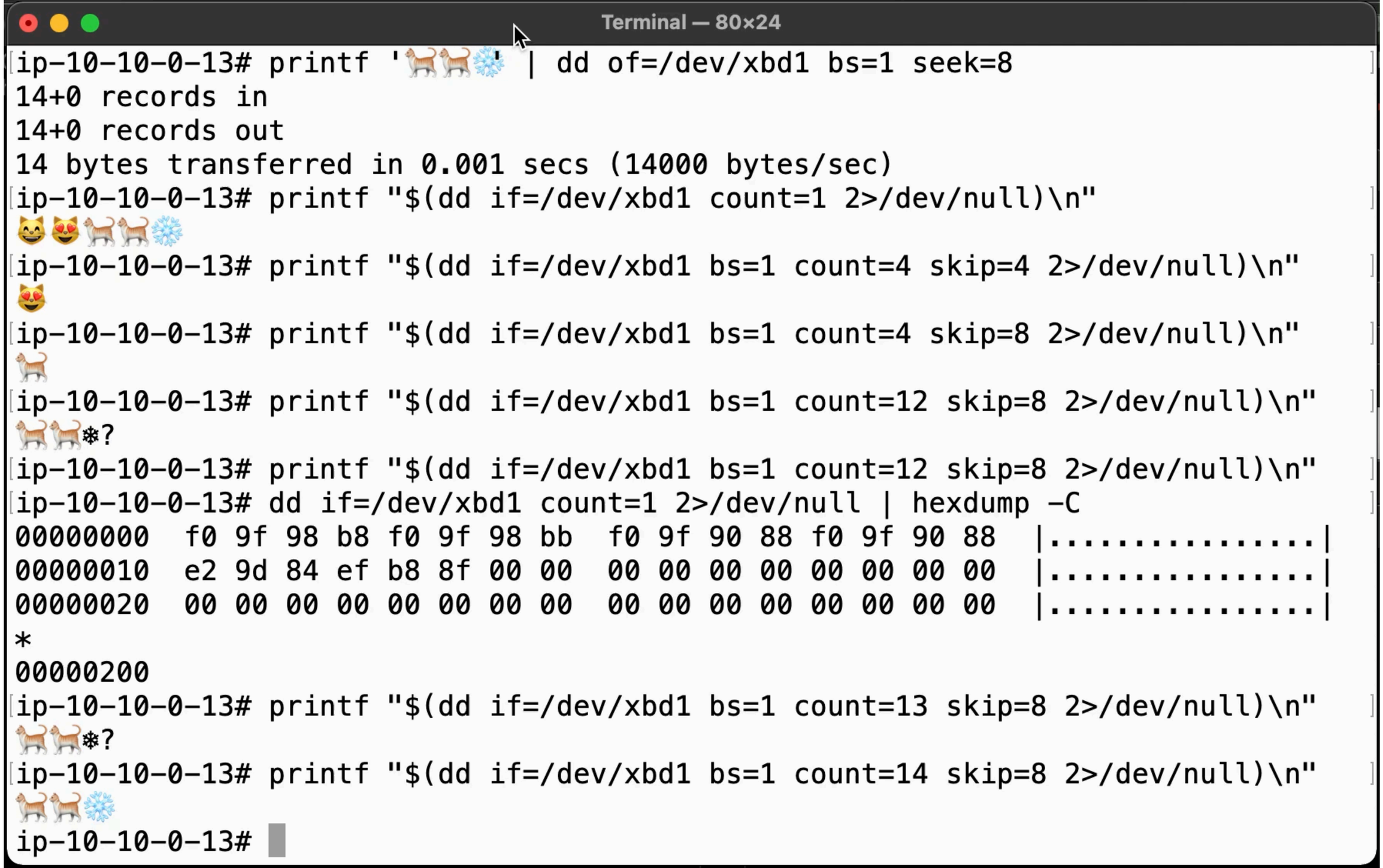
The naive approach.

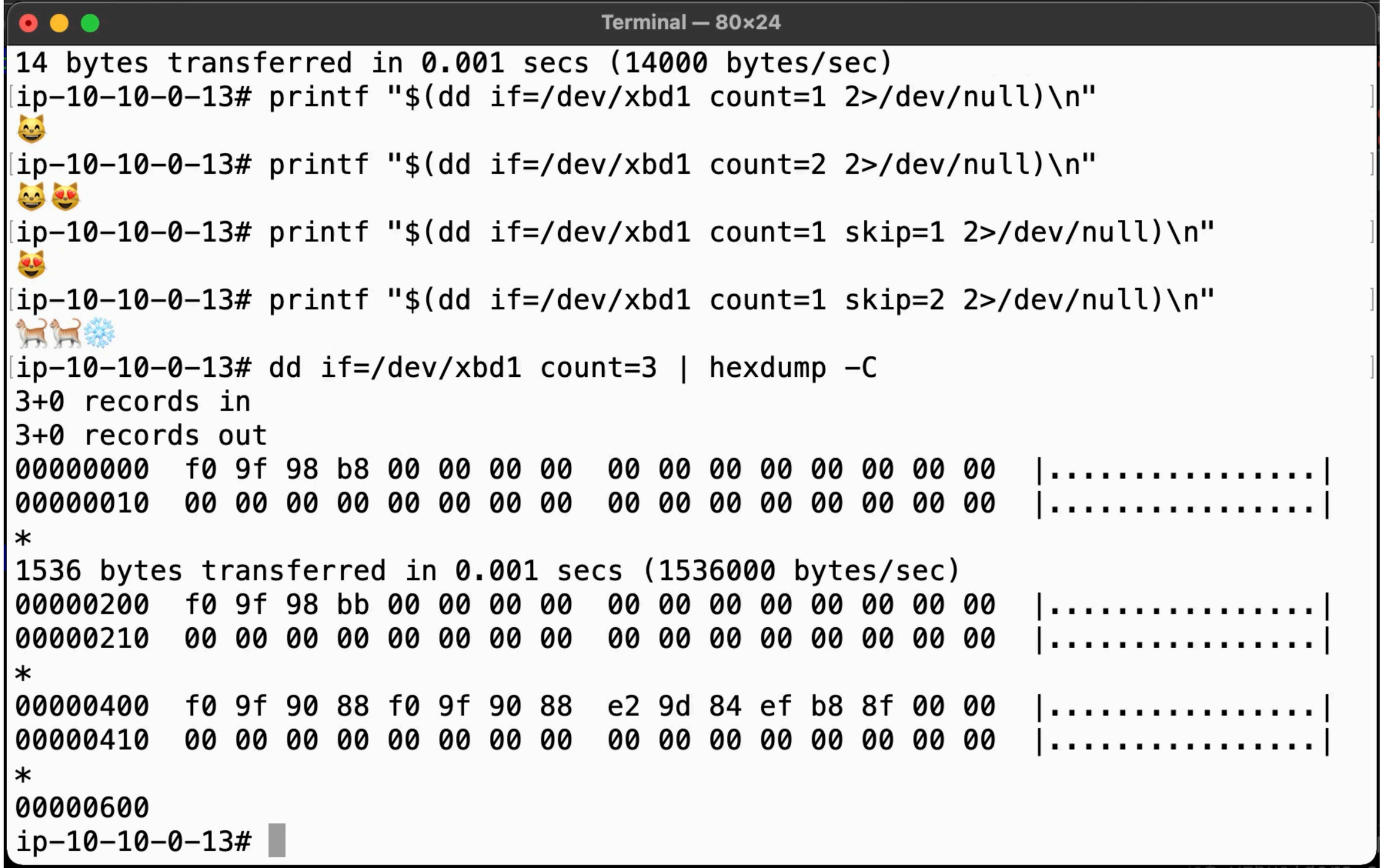
Photo by The Lucky Neko on Unsplash
https://unsplash.com/photos/2JcixB1Ky3I


Terminal — 80×24
ip-10-10-0-13#

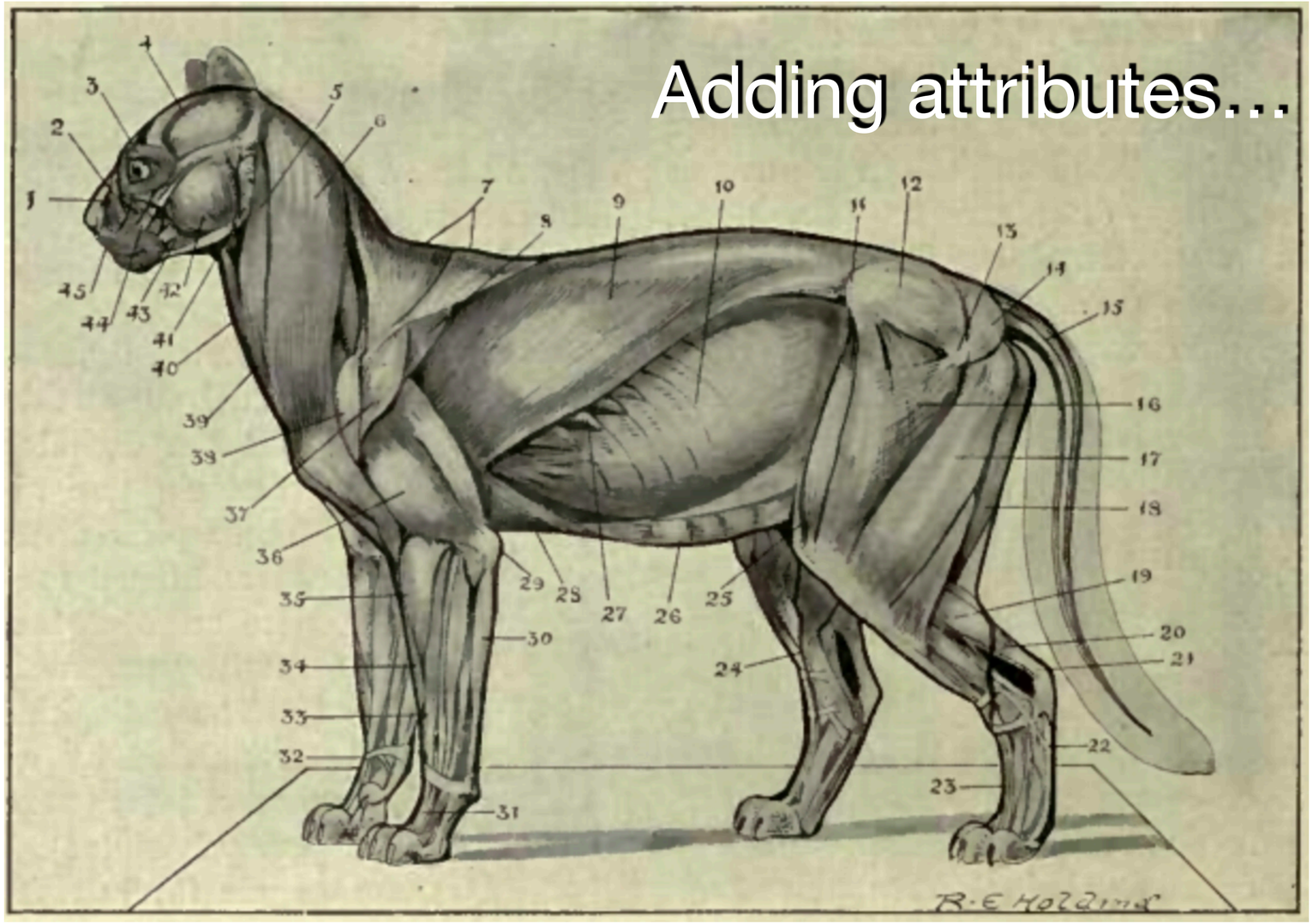
# Let’s pretend we’re a filesystem…


Photo by Marina Khrapova on Unsplash
https://unsplash.com/photos/4Tjk111E4xw


Terminal — 80×24
ip-10-10-0-13# printf '🐈🐈❄️' | dd of=/dev/xbd1 bs=1 seek=8
14+0 records in
14+0 records out
14 bytes transferred in 0.001 secs (14000 bytes/sec)
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 count=1 2>/dev/null)\n"
😻🐈🐈❄️
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 bs=1 count=4 skip=4 2>/dev/null)\n"
😻
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 bs=1 count=4 skip=8 2>/dev/null)\n"
🐈
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 bs=1 count=12 skip=8 2>/dev/null)\n"
🐈🐈❄?
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 bs=1 count=12 skip=8 2>/dev/null)\n"
ip-10-10-0-13# dd if=/dev/xbd1 count=1 2>/dev/null | hexdump -C
00000000 f0 9f 98 b8 f0 9f 98 bb f0 9f 90 88 f0 9f 90 88 |................|
00000010 e2 9d 84 ef b8 8f 00 00 00 00 00 00 00 00 00 00 |................|
00000020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |................|
*
00000200
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 bs=1 count=13 skip=8 2>/dev/null)\n"
🐈🐈❄?
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 bs=1 count=14 skip=8 2>/dev/null)\n"
🐈🐈❄️
ip-10-10-0-13#


Terminal — 80×24
14 bytes transferred in 0.001 secs (14000 bytes/sec)
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 count=1 2>/dev/null)\n"
😸
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 count=2 2>/dev/null)\n"
😸😻
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 count=1 skip=1 2>/dev/null)\n"
😻
ip-10-10-0-13# printf "$(dd if=/dev/xbd1 count=1 skip=2 2>/dev/null)\n"
🐈🐈❄️
ip-10-10-0-13# dd if=/dev/xbd1 count=3 | hexdump -C
3+0 records in
3+0 records out
00000000  f0 9f 98 b8 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000010  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
1536 bytes transferred in 0.001 secs (1536000 bytes/sec)
00000200  f0 9f 98 bb 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000210  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00000400  f0 9f 90 88 f0 9f 90 88  e2 9d 84 ef b8 8f 00 00  |................|
00000410  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00000600
ip-10-10-0-13#

# Let’s pretend we’re a filesystem…

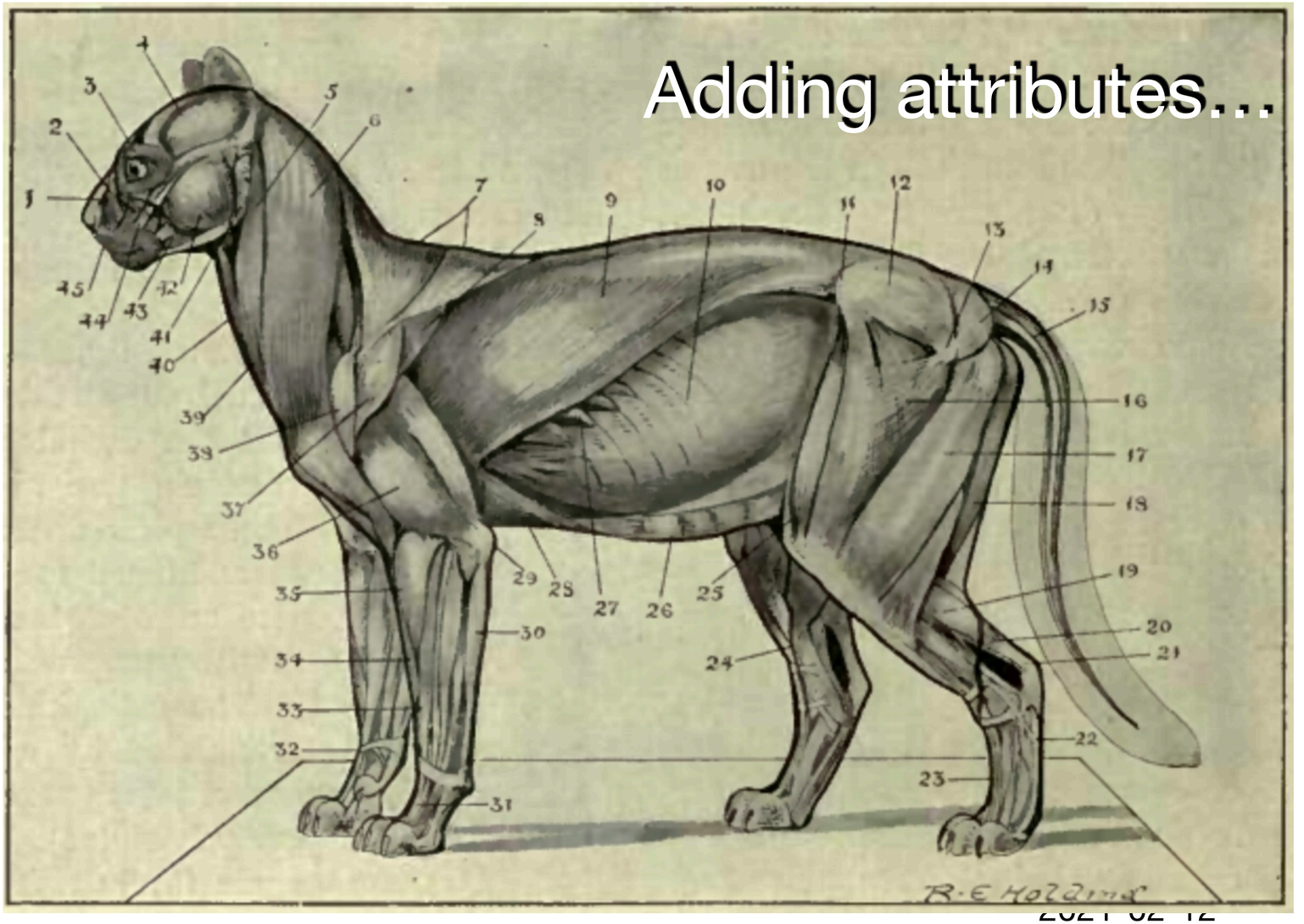


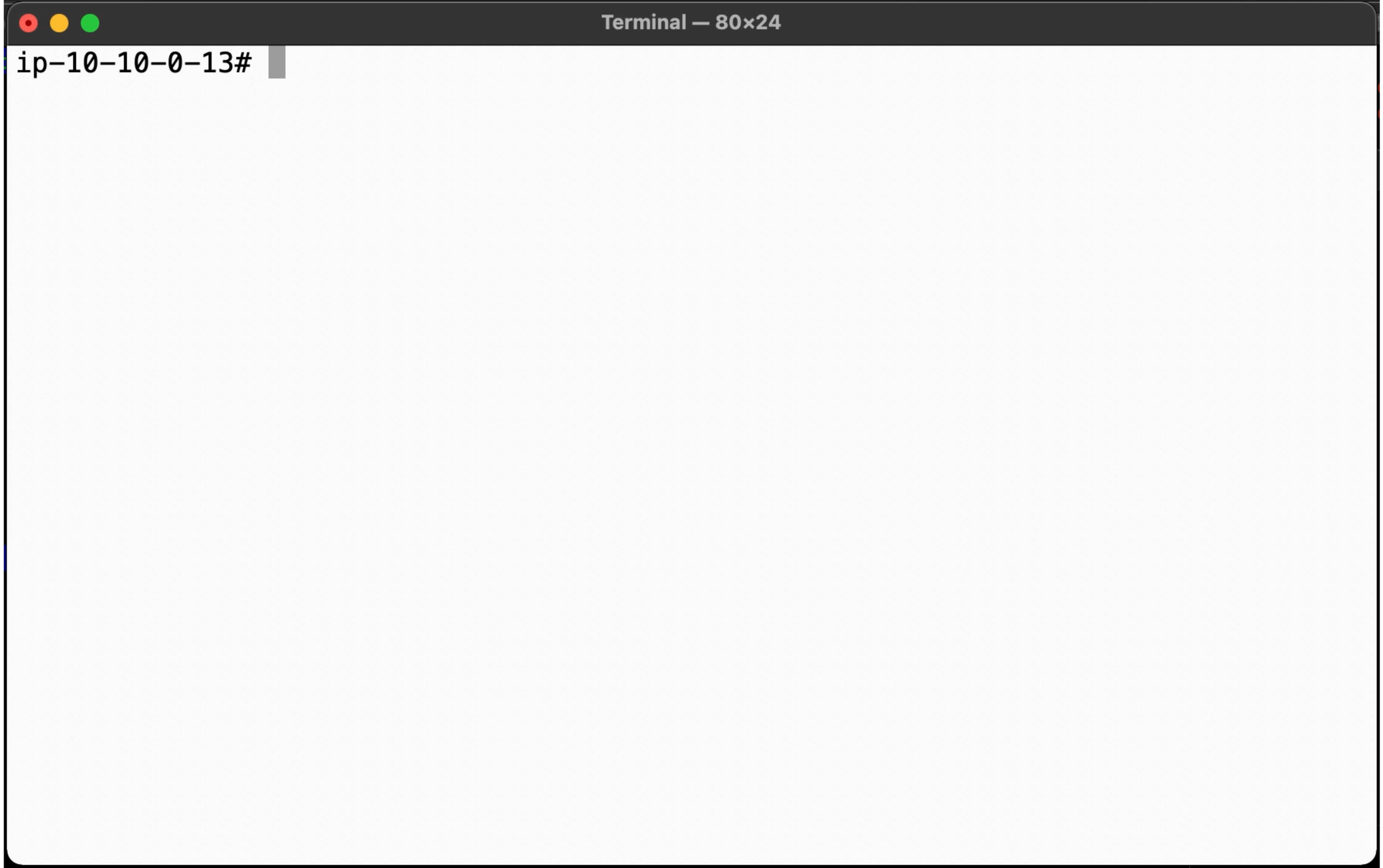
# Let's pretend we're a filesystem…

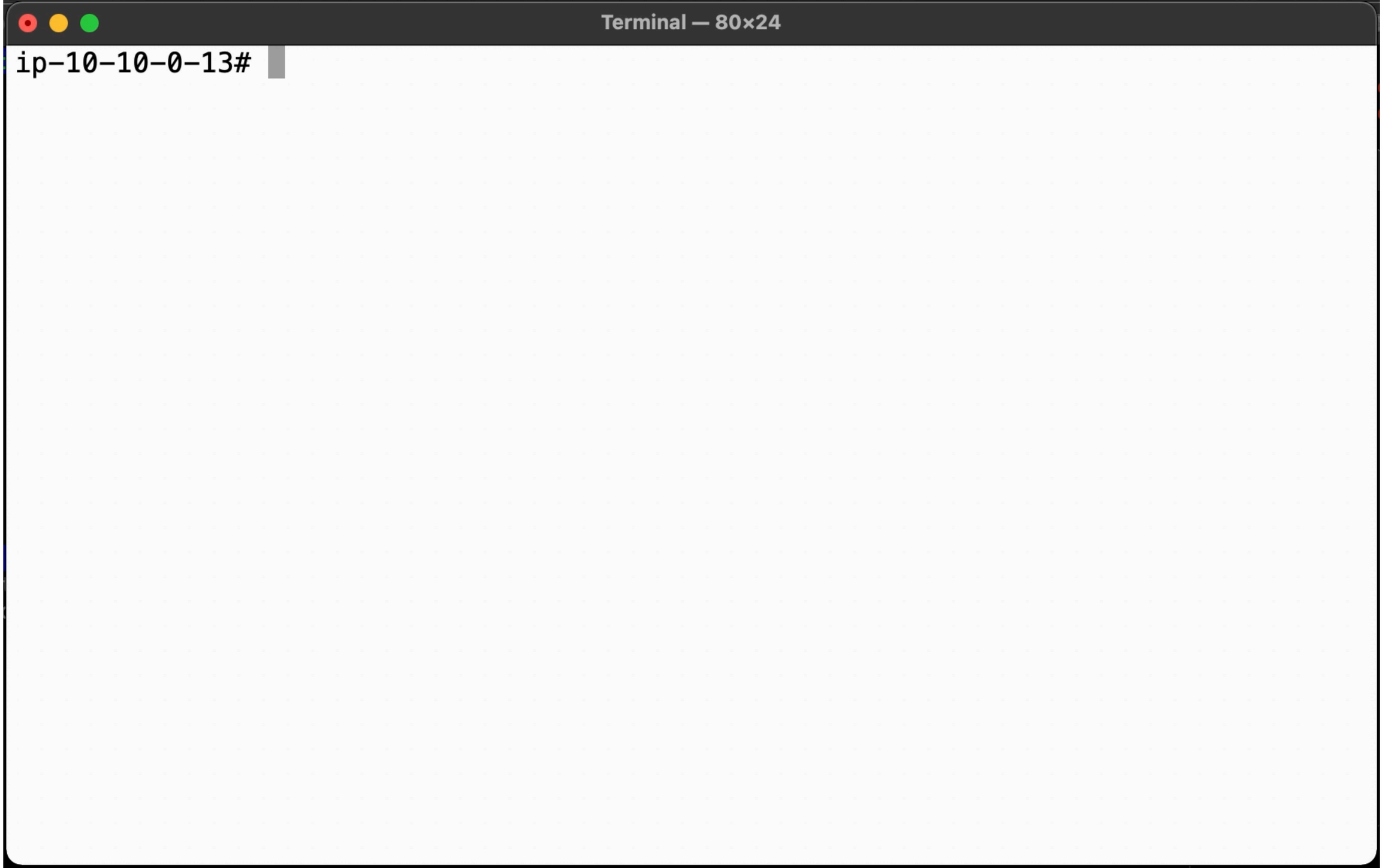
Meta-data (16 bytes total):

- identifier (2 bytes)
- permission (4 bytes)
- owner (1 byte)
- group (1 byte)
- size (4 bytes)
- offset (4 bytes)

data stored in separate area




Terminal — 80×24
ip-10-10-0-13#


Terminal — 80×24
ip-10-10-0-13#

## We don’t have to pretend to be a filesystem…

- The filesystem is responsible for storing the data on the disk.
- To read/write data, it needs to know in which physical blocks the actual data is located.
- Meta data may be separated from file data.
- On a high level, a filesystem really just describes a data storage format.

Next time: the UNIX Filesystem

# Links

File Systems and Storage Models:

https://www.netmeister.org/book/04-file-systems.pdf

Understanding Unix Filesystems:

https://is.gd/wGgJ0e