CS 3650 – Computer Systems
Spring 2024
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Lecture 22, Thur Mar 28 2024

Lab 4 2nd part

ls fs/dir ← contents of fs/dir

echo fs/dir/* ← same

stat -c '%format stuff' - print specific getattr results

(cd fs/dir;
echo *)

cksum file

or

cksum < file

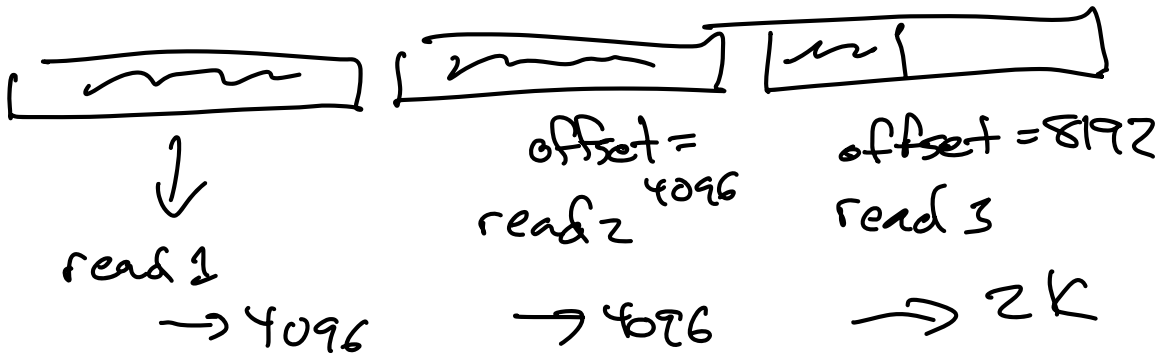
+ dd for varied read size

python3 print-disk.py test.img

Reads

4K:

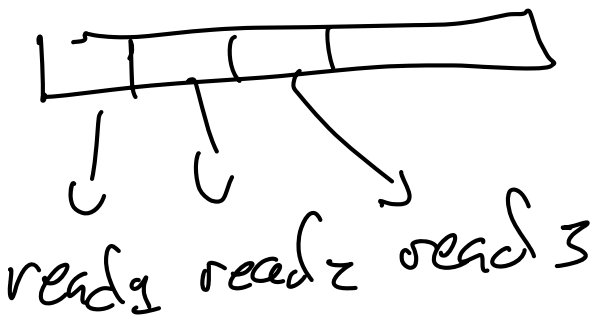
read(buf, offset, len=4096)



read(buf, 0, len=100)

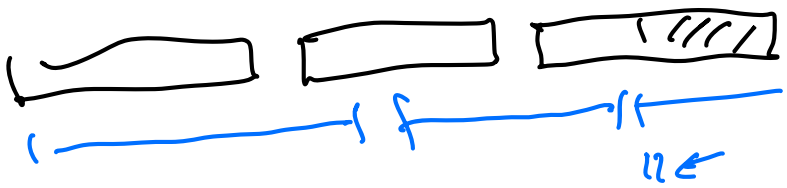
.. (buf, 100, len=100)

- - - -



read(buf, 0, 5000)

read(buf, 5000, 5000)



dd if=file bs=N | cksum

input file

"block" size

(read len)

dd if=fs/file.1 bs=300 | cksum

cksum < fs/file.1

} should be same

How to package these in a test script

possible errors: dirs missing entries
bad mode
various data errors
- visible w/ 4K reads
- only non-4K reads

MISSING <path>
CKSUM <path>
STAT <path> (??)

```
root.entries
(cd fs; echo *) > /tmp/tmpfile
if ! diff -q root.entries /tmp/tmpfile; then
    echo MISSING/
fi
```

Shell script basics

```
if cmd; then
    cmds
fi
```

```
if ! cmd; then
```

if cmd not "successful"

e.g. diff or cmp:
true if no diff

substitution:

```
c=$(cmd)
```

```
=$((cd fs/dir; echo *))
```

space

```
if ["$c" != "file1 file2 file3"]; then
    m
fi
```

the [command

why the extra ( ) ?

(cd fs/$dir; echo *)
= do 2 cmds not 1

$x ← value of variable x

```
c=$(cksum < fs/file.1)
if [ "$c" != "123456 900" ]; then
    ~
fi
```

"4..11" ← expand $ inside string

'1..1' ← don't expand anything

```
while read a b c; do
    echo $b
done < file
```

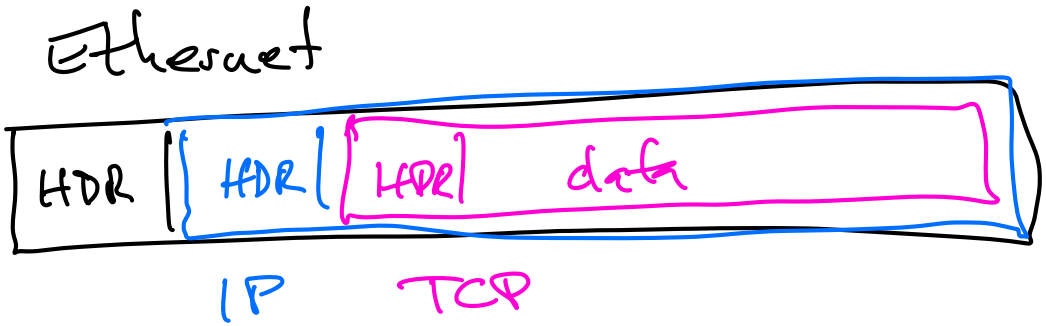
> 1 2 3
> 4 5 6
> ...

file:

```
1 2 3
4 5 6
7 8 9
10 11 12 13
```

a=10 b=11 c="12 13"

Networking



ethernet, wifi:
- it works

IP:
- src, dst addrs

32 bit, topologically significant
(routing by power-of-2 ranges)

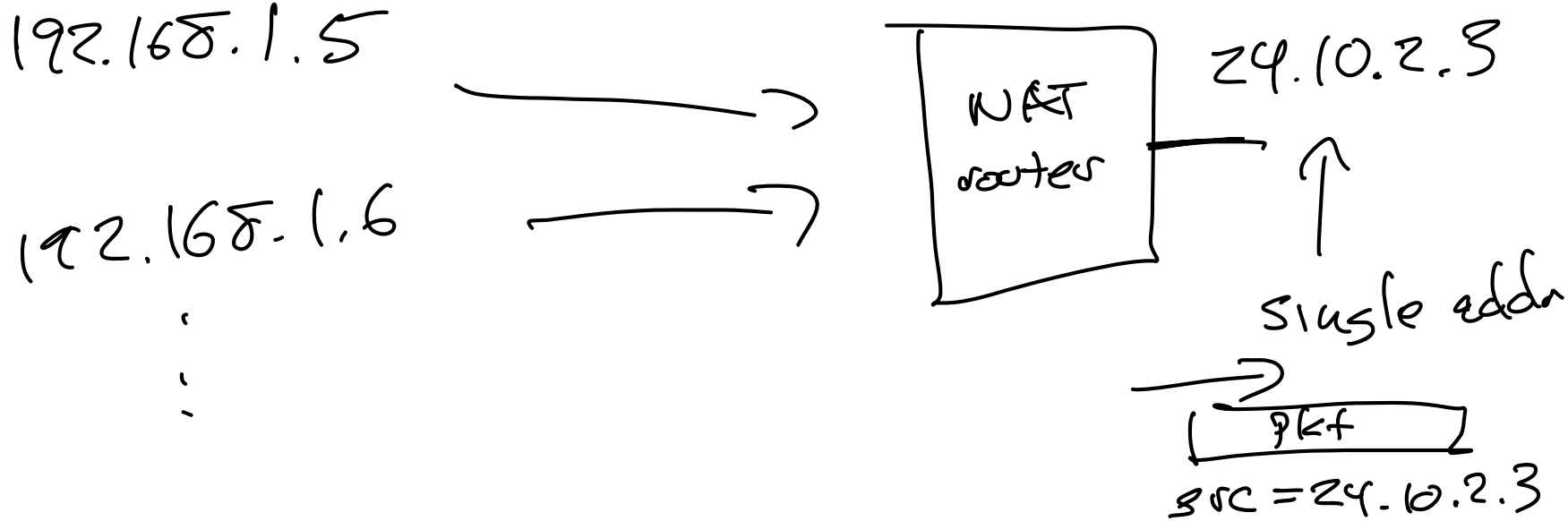
private networks { 10.*.*.*
{ 192.168.*.*

DNS: name ⇒ IP addr

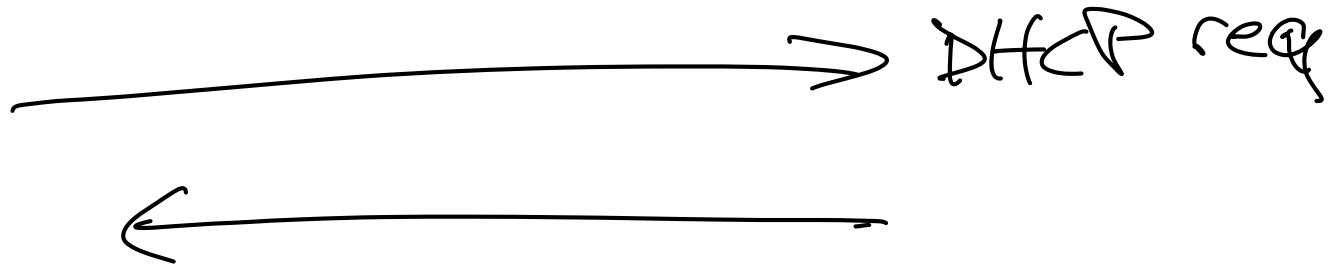
10.110.180.74

ifconfig en0

Network address translation



DHCP - dynamic host config protocol



IP address

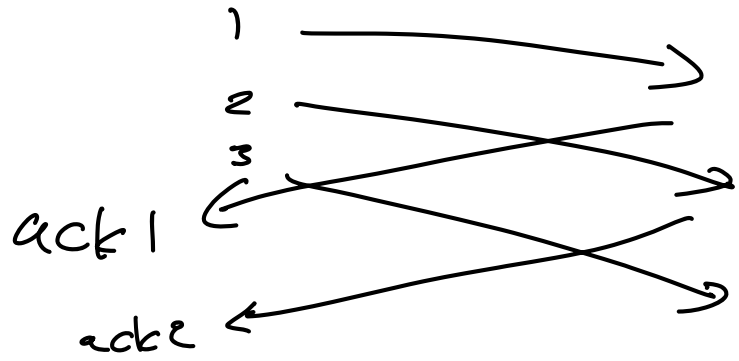
router IP
(gateway)

DNS server IP

TCP transmission control prot.

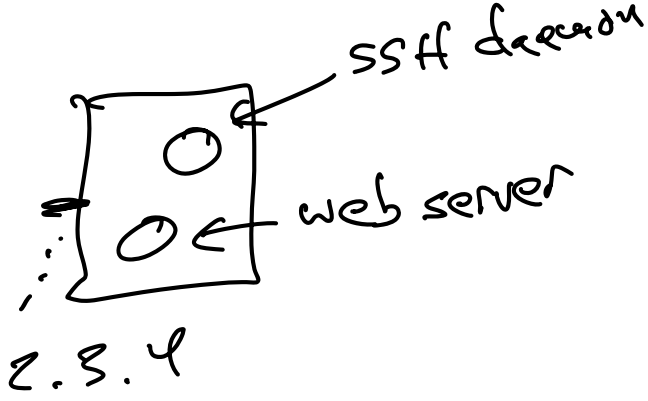
- retransmission (reliability)

IP address = interface, not machine



- byte stream
- port number

80 - HTTP
22 - SSH
see /etc/services



TCP socket connection