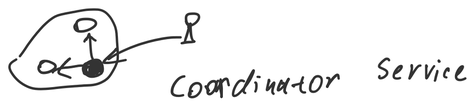
понедельник, 5 сентября 2022 г. 14:14



RPC

Remote procedure call

client — server

```
class Calc : public RPCService {
    int calc(int a, int b) {
        return a+b;
    }
};
```

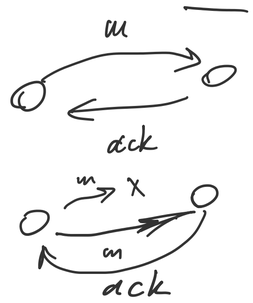
Stub s;

f = s.calc(1,2);

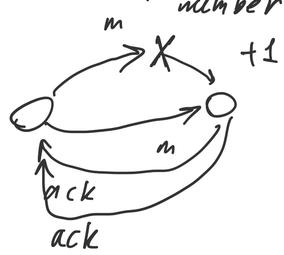
- Stub
- Service

bottleneck

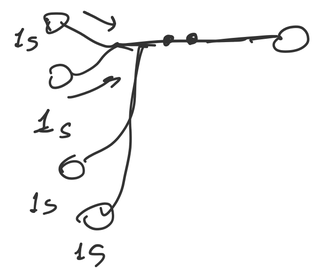
TCP



Sequence number



Exponential backoff



Client

stub.calc(a,b)

(calc, bytes)

channel

RPC

bytes

socket

packets

Connection

Server

service

calc(a,b)

(calc, a,b)

server

RPC

bytes

listener

network

Network	size —	throughput 10 Gbit/s ≈ 1 Gb/s	latency cross dc 100 ms	dc 1 ms
RAM	1 Tb	10 Gb/s	100ns	
HDD	10 Tb	100 Mb/s	10 ms	
SSD	10 Tb	10 Gb/s	100 µs	

External memory model

#I/Os

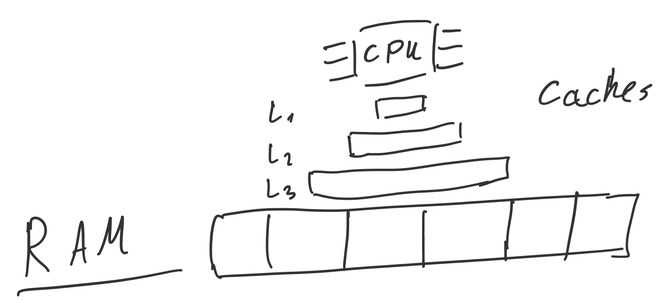
$$phys(X) = 10ms + \frac{X}{100Mb/s}$$

$$model(X) = \frac{X}{B}$$

$$B \geq 1Mb$$

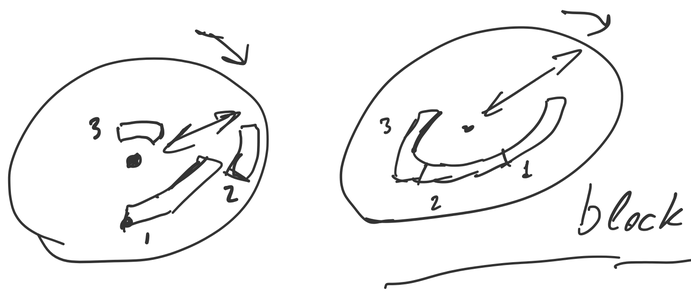
$$X \gg B$$

RAM



HDD

512 bytes



block

SSD

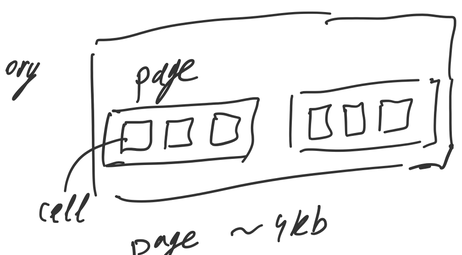
Non-volatile memory

- Cell lifetime
- Alignement
- No overwrites

FTL

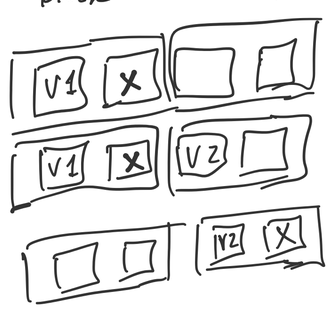
Flash Transition Level

- Garbage collection



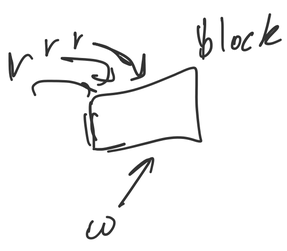
page ~ 4kb

block ~ 256 pages



write amplification

$t_{write} > t_{read}$



tail latency