L9: Performance

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Simple server

while True:
    wait for request
    data = read(name)
    compute
    send response
Hitachi 7K400
Disk sectors
I/O bottleneck

Hypothetical Effects of Dissimilar Doubling Rates Over a Decade
Important numbers

• Latency:
  0.000001 msec: one instruction (1ns)
  0.0001 msec: one DRAM load (100ns)
  0.1 msec: LAN network
  10 msec: random disk I/O
  25 msec: east coast → west coast (fiber)

• Throughput:
  10,000 MB/sec: DRAM
  1,000 MB/sec: LAN (or 100 MB/sec)
  100 MB/sec: sequential disk (or 500 MB/sec)
  1 MB/sec: random disk