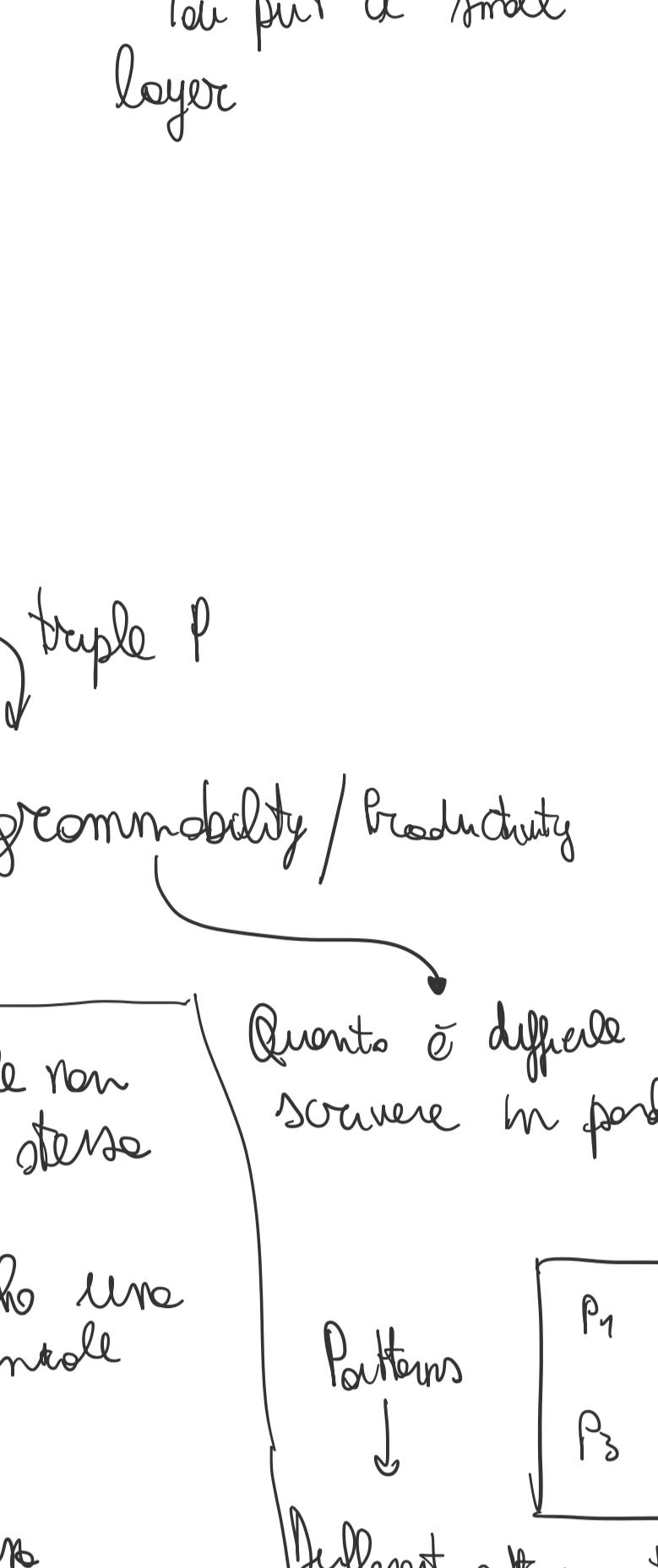


Fork-join
model

FORK

JOIN

Sostituzione delle lettere
in place.Se assegno le stesse lettere a
due thread uno me lo modifica
e l'altro lo riporta a come
era all'inizio.→ OpenMP - libreria → implementata in
g++,iccg++
-fopenmpCon un solo #pragma permette di fare
ordine in parallelo un forSe ho: for ($i=0; i < N; i++$) {
primo del
for scrivere
il programma...}le operazioni
che devono essere
indipendente da loro

→ Cilk → fork/join

(spawn e)

- ↳ parallel for con openmp
- ↳ cilk for(--) {
 }
 }

→ Pattern libraries

Grppi = attempt to move to C++ some pattern of parallel computation, runs on top of MPI, TBB, C++ threads, OpenMP
Il for lo faccio con map
grppi::map(seq, --)
Requested

You put a small layer

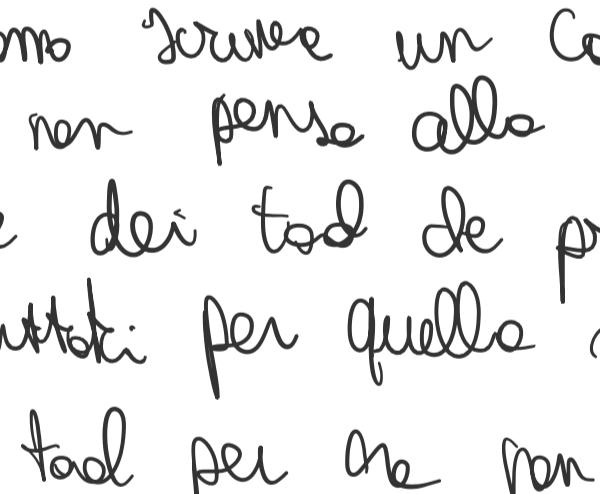
Quali di questi dovrei usare?

Non è importante solo il tempo, triple P

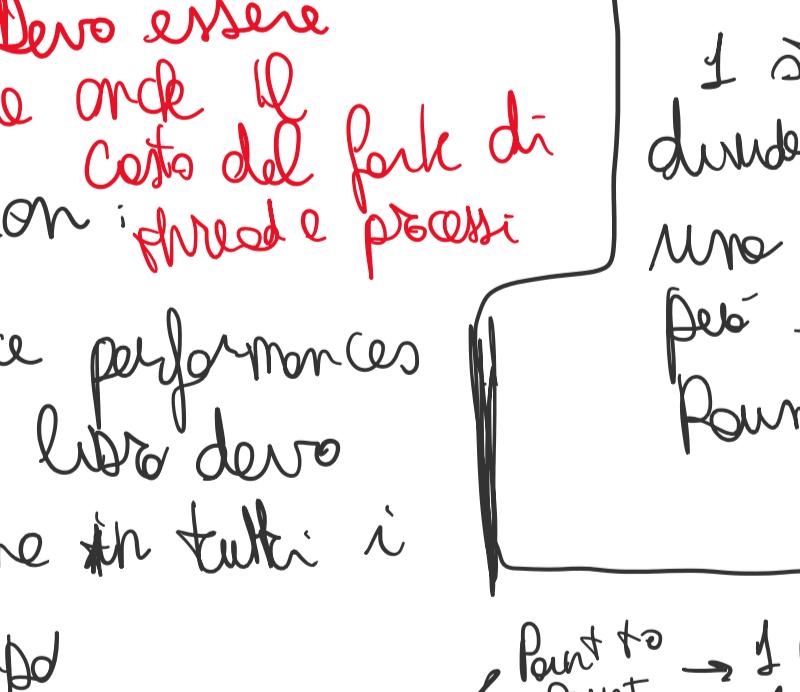
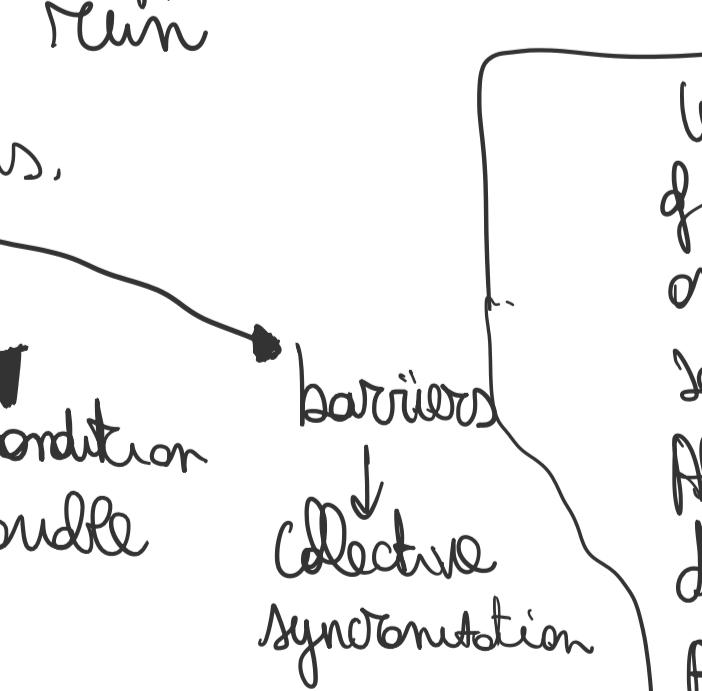
→ Performance + Portability + Reusability / Productivity

time
Tc
Completion time
power
(time * power)

Vogliamo qualcosa
che necessiti di poco
tempo per essere
calcolato e che
non consumi troppo
energia

Le macchine parallele non
hanno tutte la stessa
struttura.Ad esempio se ho una
macchina sequenzialeE' particolare un
Von Neumann MachinePossiamo avere più processori
ma allo stesso modo
abbiamo memoria diversa
la memoriaNelle macchine parallele
la struttura è diversa;

Parallel Machine
Cluster
Shared Memory
GPU
FPGA

we have the main memory,
some cachesthe core 1 is one processor with
2 cores and it stores L2 with other
processors

Struttura Xeon, i5, i7

Xeon phi: 1st version

we have a bus attached to memory

this require constant time

If I want to ensure portability

→ Considerare Xeon phi KNC:

We need a way to do things
in parallel. Dov'è esserecopie di valori o fork di
processi del fork dihas very different performances
Se per lavorare al libro devocopiare le storie in tutti i
thread perdo tempo

(Shared memory, memory passing)

(important because there are
different way and different
performances to run

synchronizations.

Xeon phi: 2nd version

we have a bus attached to memory

this require constant time

Xeon phi: 3rd version

we have a bus attached to memory

this require constant time

Xeon phi: 4th version

we have a bus attached to memory

this require constant time

Xeon phi: 5th version

we have a bus attached to memory

this require constant time

Xeon phi: 6th version

we have a bus attached to memory

this require constant time

Xeon phi: 7th version

we have a bus attached to memory

this require constant time

Xeon phi: 8th version

we have a bus attached to memory

this require constant time

Xeon phi: 9th version

we have a bus attached to memory

this require constant time

Xeon phi: 10th version

we have a bus attached to memory

this require constant time

Xeon phi: 11th version

we have a bus attached to memory

this require constant time

Xeon phi: 12th version

we have a bus attached to memory

this require constant time

Xeon phi: 13th version

we have a bus attached to memory

this require constant time

Xeon phi: 14th version

we have a bus attached to memory

this require constant time

Xeon phi: 15th version

we have a bus attached to memory

this require constant time

Xeon phi: 16th version

we have a bus attached to memory

this require constant time

Xeon phi: 17th version

we have a bus attached to memory

this require constant time

Xeon phi: 18th version

we have a bus attached to memory

this require constant time

Xeon phi: 19th version

we have a bus attached to memory

this require constant time

Xeon phi: 20th version

we have a bus attached to memory

this require constant time

Xeon phi: 21st version

we have a bus attached to memory

this require constant time

Xeon phi: 22nd version

we have a bus attached to memory

this require constant time

Xeon phi: 23rd version

we have a bus attached to memory

this require constant time

Xeon phi: 24th version

we have a bus attached to memory

this require constant time

Xeon phi: 25th version

we have a bus attached to memory

this require constant time

Xeon phi: 26th version

we have a bus attached to memory

this require constant time

Xeon phi: 27th version

we have a bus attached to memory

this require constant time

Xeon phi: 28th version

we have a bus attached to memory

this require constant time

Xeon phi: 29th version

we have a bus attached to memory

this require constant time

Xeon phi: 30th version

we have a bus attached to memory

this require constant time

Xeon phi: 31st version

we have a bus attached to memory

this require constant time

Xeon phi: 32nd version

we have a bus attached to memory

this require constant time

Xeon phi: 33rd version

we have a bus attached to memory

this require constant time

Xeon phi: 34th version

we have a bus attached to memory

this require constant time

Xeon phi: 35th version

we have a bus attached to memory

this require constant time

Xeon phi: 36th version

we have a bus attached to memory

this require constant time

Xeon phi: 37th version

we have a bus attached to memory

this require constant time

Xeon phi: 38th version

we have a bus attached to memory

this require constant time

Xeon phi: 39th version

we have a bus attached to memory

this require constant time

Xeon phi: 40th version

we have a bus attached to memory

this require constant time

Xeon phi: 41st version

we have a bus attached to memory

this require constant time

Xeon phi: 42nd version

we have a bus attached to memory

this require constant time

Xeon phi: 43rd version

we have a bus attached to memory

this require constant time

Xeon phi: 44th version

we have a bus attached to memory

this require constant time

Xeon phi: 45th version

we have a bus attached to memory

this require constant time

Xeon phi: 46th version

we have a bus attached to memory

this require constant time

Xeon phi: 47th version

we have a bus attached to memory

this require constant time

Xeon phi: 48th version

we have a bus attached to memory

this require constant time

Xeon phi: 49th version

we have a bus attached to memory

this require constant time

Xeon phi: 50th version

we have a bus attached to memory

this require constant time

Xeon phi: 51st version

we have a bus attached to memory

this require constant time

Xeon phi: 52nd version</div