Comparative Concurrency

Topics in Parallel Processing -- offered Fall 1986
CIS 4932 - 01
CIS 5934 - 01 MWF 1:25 - 2:15 215 HTL

PREREQUISITES: COP 4611 and CDA 4102.

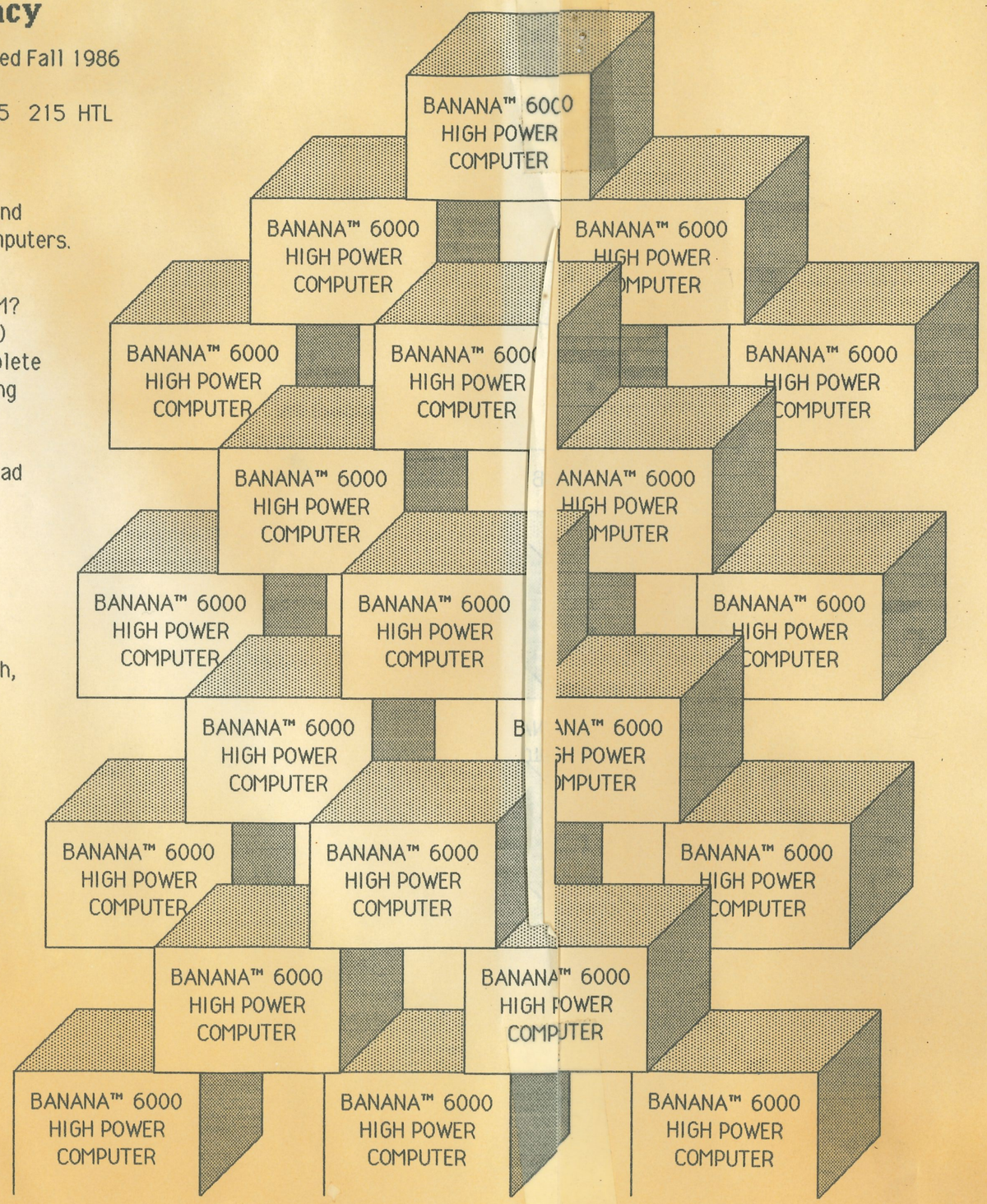
Suppose you have a big problem and have to divide it among a bunch of computers.

- HOW DO YOU PARTITION THE PROBLEM? (i.e. which computer does which part?)
1. LOAD BALANCING: The job will complete the fastest if each computer is working about the same amount.
2. BALANCING TIME: Do you design the problem with balance, or balance at load time or even buy special machines to balance at execution time?

- HOW DO THE PARTS COMMUNICATE?
1. NETWORK TOPOLOGY: How the computers are interconnected is a factor here (shared memory, ring, mesh, hypercube, ethernet).
2. NAMES: A common "yellow pages" on one machine or several copies? Do things move?
3. Can messages be delayed?

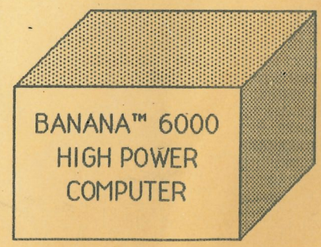
- HOW DO YOU SYNCHRONIZE THE PARTS?
1. If you have more than one machine just turning off interrupts isn't enough.

- EXPLORE:
1. The bottlenecks.
2. The trade offs.
3. The answers aren't known.



- EXAMPLE PROBLEMS COVERED:
1. A scientific problem, most likely image processing.
2. A discrete event simulations, via "time warp".
3. Tree searching -- for expert systems perhaps.

- For more details see BELLENOT



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