BUS BASED AND SWITCH MULTICOMPUTERS

Bus based multicomputers

Building a multicomputer (i.e no shared memory) is easy. Each CPU has a direct connection to its own local memory. The only problem left is how CPUs communicate with each other.

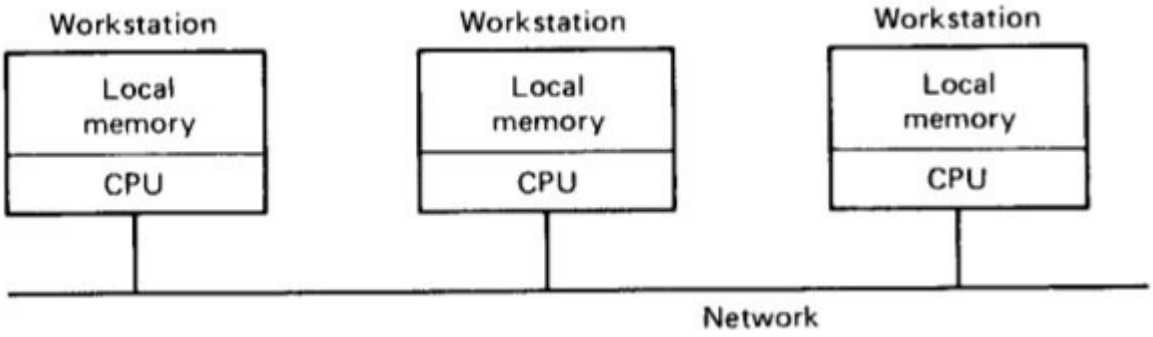


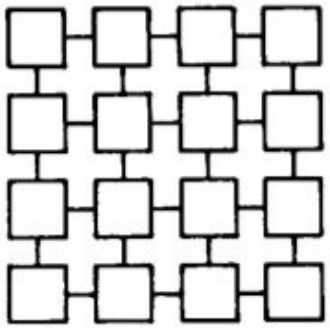
Fig. A multicomputer consisting of workstations on a LAN.

CPUs are connected to each other via LAN (10 or 100Mbps).

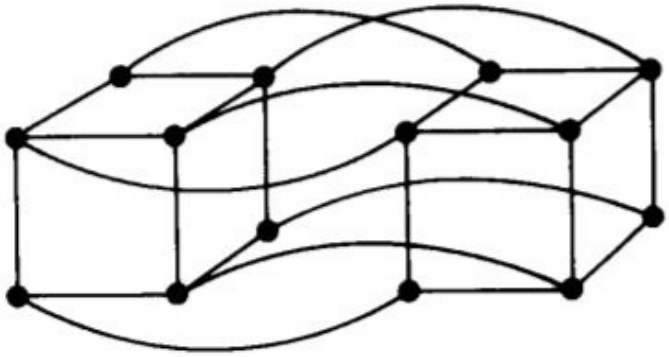
Switch Multicomputers

Switched multicomputers do not have a single bus over which all traffic goes. Instead, they have a collection of point-to-point connections. In we see two of the many designs that have been proposed and built: a grid and a hypercube. A grid is easy to understand and easy to lay out on a printed circuit board or chip. This architecture is best suited to problems that are two dimensional in nature (graph theory, vision,etc.)

Another design is a hypercube which is an n -dimensional cube. One can imagine a 4-dimensional hypercube as a pair of ordinary cubes with the corresponding vertices connected, as shown in fig. Similarly, a 5-dimensional hypercube can be represented as two copies of Fig.4.5(b), with the



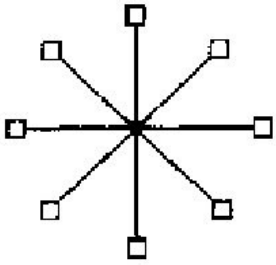
(a) A grid



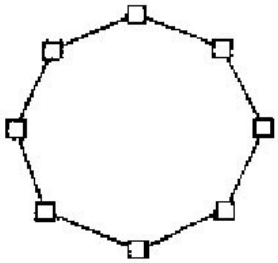
(b) 4-D Hypercube

corresponding vertices connected, andso on. In general, an n -dimensional hypercube has 2 n vertices, each holding one CPU. Each CPU has a fan-out of n , so the interconnection complexity grows logarithmically with the number of CPU.

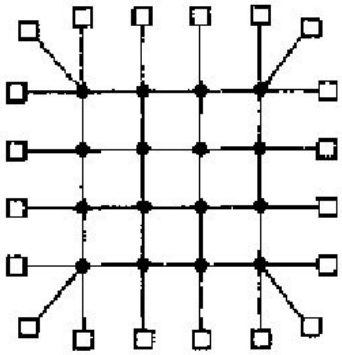
Various interconnection have been proposed and built, but all have the property that each CPU has direct and exclusive access to its own private memory.



A single switch



A ring



A grid

Source : http://dayaramb.files.wordpress.com/2012/02/operating-system-pu.pdf