

NAME: UYE TIMILEYIN

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QUESTIONS

Briefly explain the following interconnection networks

- i) The cross bar network
- ii) Cube interconnection network
- iii) Fat tree connection

SOLUTION

i) The Cross Bar Network

Crossbar networks allow any processor in the system to **connect** to any other processor or memory unit so that many processors can communicate simultaneously without contention. A new **connection** can be established at any time as long as the requested input and output ports are free.

ii) Cube Interconnection Network

Interconnection networks, also called multi-stage **interconnection networks** (or MINs), **are** high-speed computer **networks**

The minimum distance between a pair of nodes is the minimum number of communication links (hops) that data from one of the nodes must traverse in order to reach the other node.

Cube interconnection network:

It is a 3 dimensional

interconnection network. At

node 1, t_0 is set to 0; thus T now becomes equal to 100

iii) Fat Tree Network

The **fat tree network** is a universal network for provably efficient communication.

In a tree data structure, every branch has the same thickness, regardless of their place in the hierarchy—they are all

"skinny" (*skinny* in this context means low-bandwidths). In a fat tree, branches nearer the top of the hierarchy are "fatter" (thicker) than branches further down the hierarchy. In a telecommunications network , the branches are data links; the varied thickness (bandwidth) of the data links allows for more efficient and technology-specific use.

Mesh and Hypercube topologies have communication requirements that follow a rigid algorithm, and cannot be tailored to specific packaging technologies