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CSC 310

Computer science

Question

Briefly explain the following interconnection networks

1. The crossbar Network

2. Cube interconnection Network

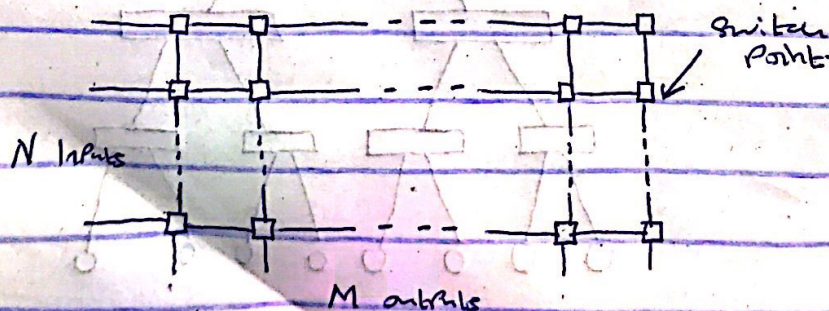
3.

Answer

1. The crossbar Network.

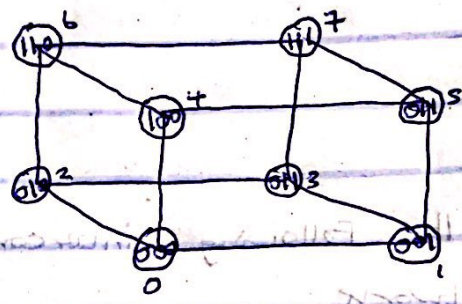
A crossbar has every node of the network connected to every other nodes. Any nodes can send simultaneous message to every other nodes in the system without conflicts, this network topology is non-blocking.

Therefore it allow any processor in the system to connect to any other processor or memory unit so that many processor can communicate simultaneously without contention. New connection can be established at any time as long as the requested input & output ports are free. They are used in design of high performance small-scale multiprocessor and as basic component in the design of large scale indirection network.

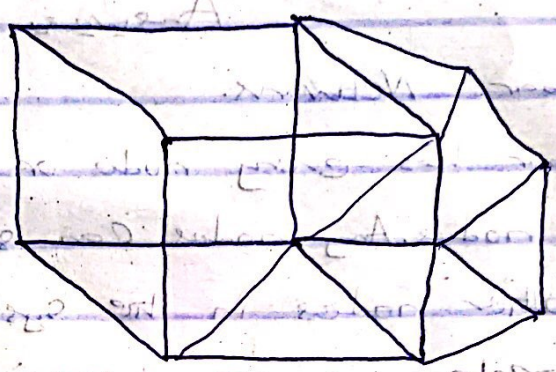


## 2. Cube Interconnection Network.

It's a 3-dimensional interconnection network.



Hyper cube: A hypercube interconnection network is an extension of cube network. It is a 4-dimensional interconnection network.



4-dimensional.

## 3. The fat tree connection.

The structure of the fat tree is based on a binary tree. Each edge of the binary tree correspond to two channels of the fat tree. One of the channel is from parent to child and vice-versa.

