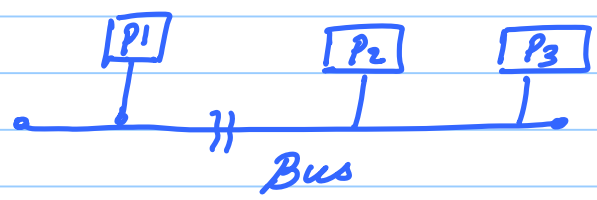


Nov 16<sup>th</sup>

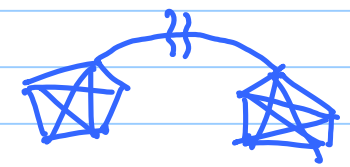
• Multi Processors.



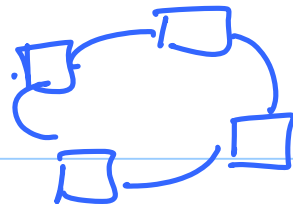
Bus: Only one message can be sent at a time

Two schemes

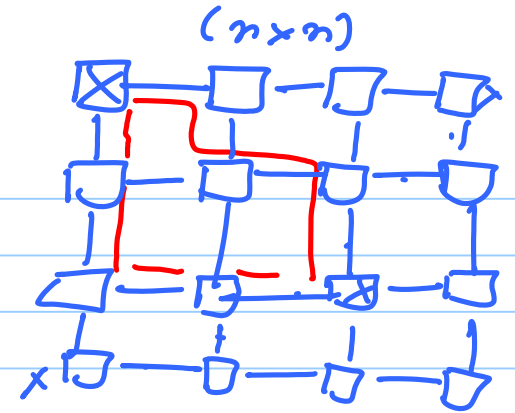
- Central arbiter.
- Daisy chaining
  - Token is passed between processors.



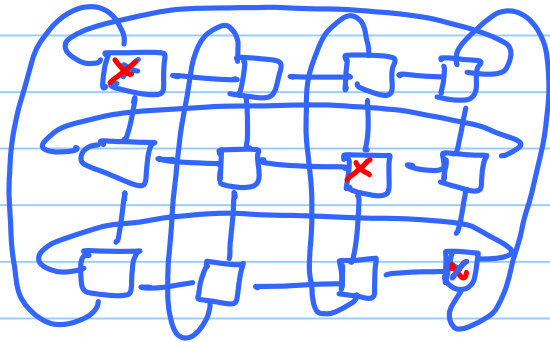
Ring



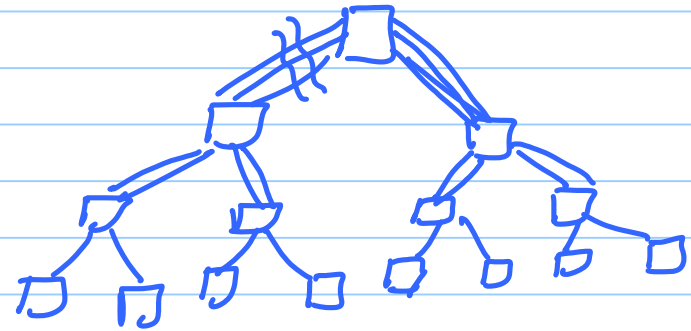
Mesh



2D-TORUS



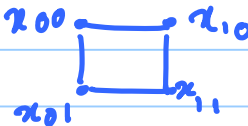
FAT TREE

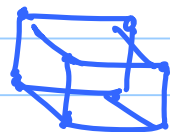



## HYPERCUBE

$H_0$  : 

$H_1$  : 

$H_2$  : 

$H_3$  : 

$H_4$  : 

www. top 500. org.

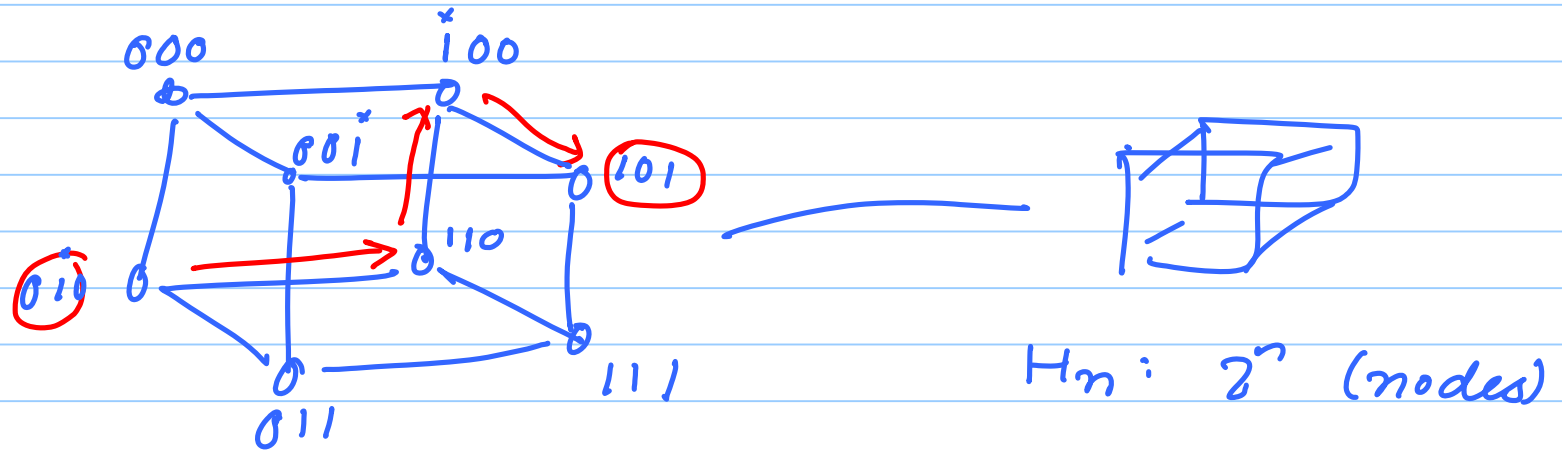
1. TIANHE-1A (CHINA)
2. CRAY (US)
3. ROAD RUNNER (IBM)
4. BLUEGENE (IBM)

# NODES :

# EDGES :

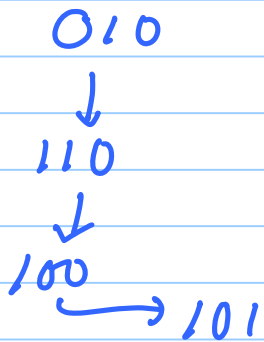
BISECTION BANDWIDTH:  
min. no. of  
links that you  
need to cut to  
divide the network  
into two equal  
parts.

{ Diameter: Max.  
 shortest path  
 between any two  
 pairs of nodes.

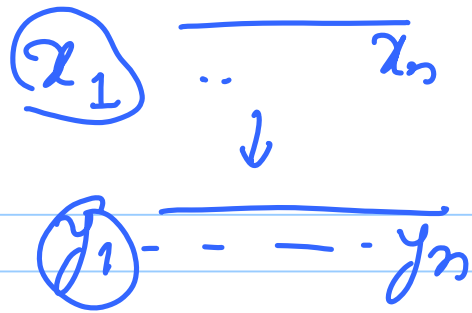


$H_n: 2^n$  (nodes)

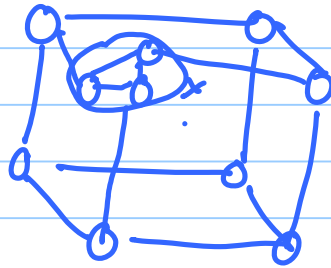
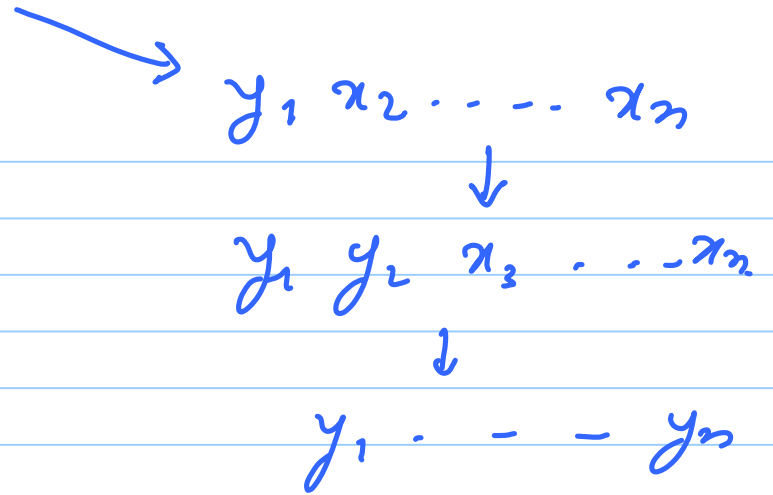
Diameter of a hypercube:



65,536 :  $H_{16}$   
 (nodes)

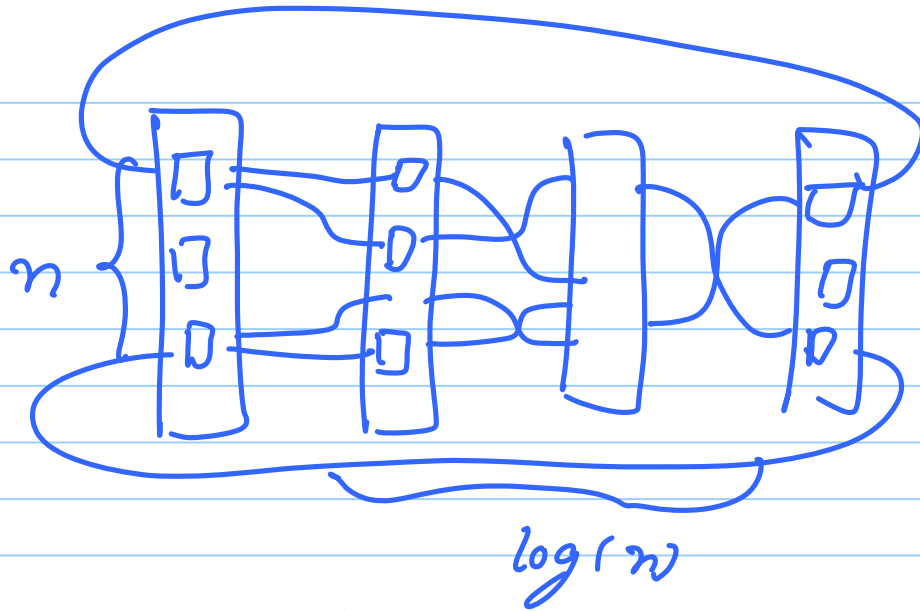


010 ↘  
101



CCC  
Cube Connected Cycle.

Broad Idea of Shuffle / Omega networks.



CROSS BAR

