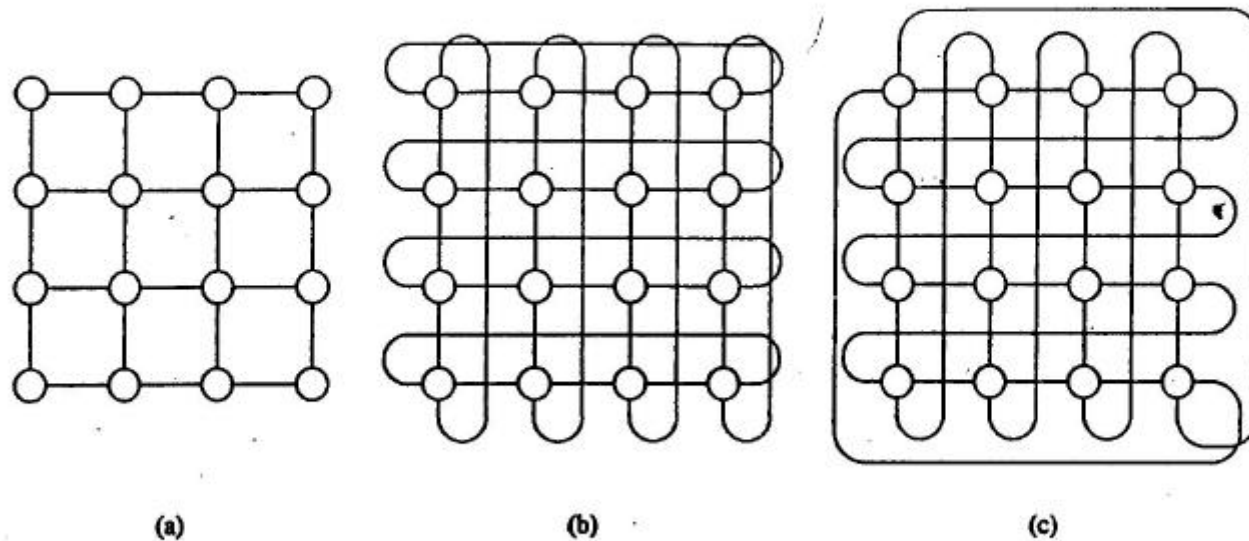# ORGANISASI PROSESOR

Organisasi Prosesor

◆ Kriteria untuk menunjukan efektifitas dalam implementasi algoritma paralel pada hardware adalah:

- Diameter
  - Jarak terbesar antara dua prosesor (node)
- Bisection Width
  - Jumlah minimum edges yang harus dihilangkan untuk membagi jaringan dalam dua bagian
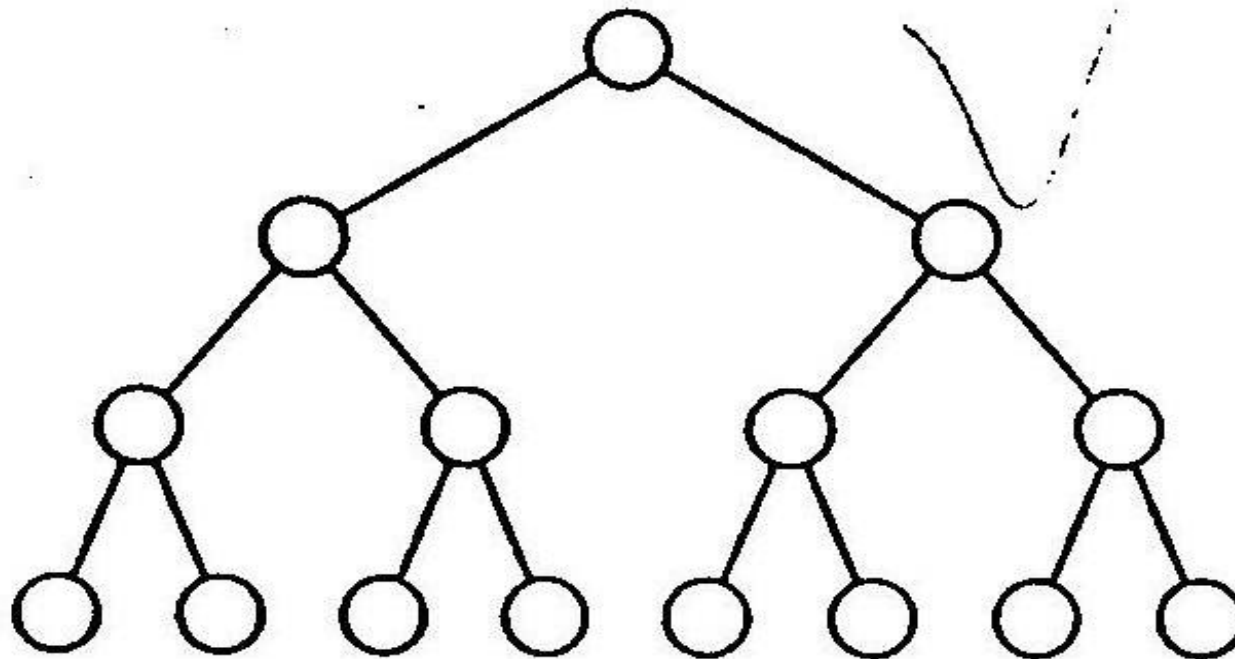- Number of edge per node
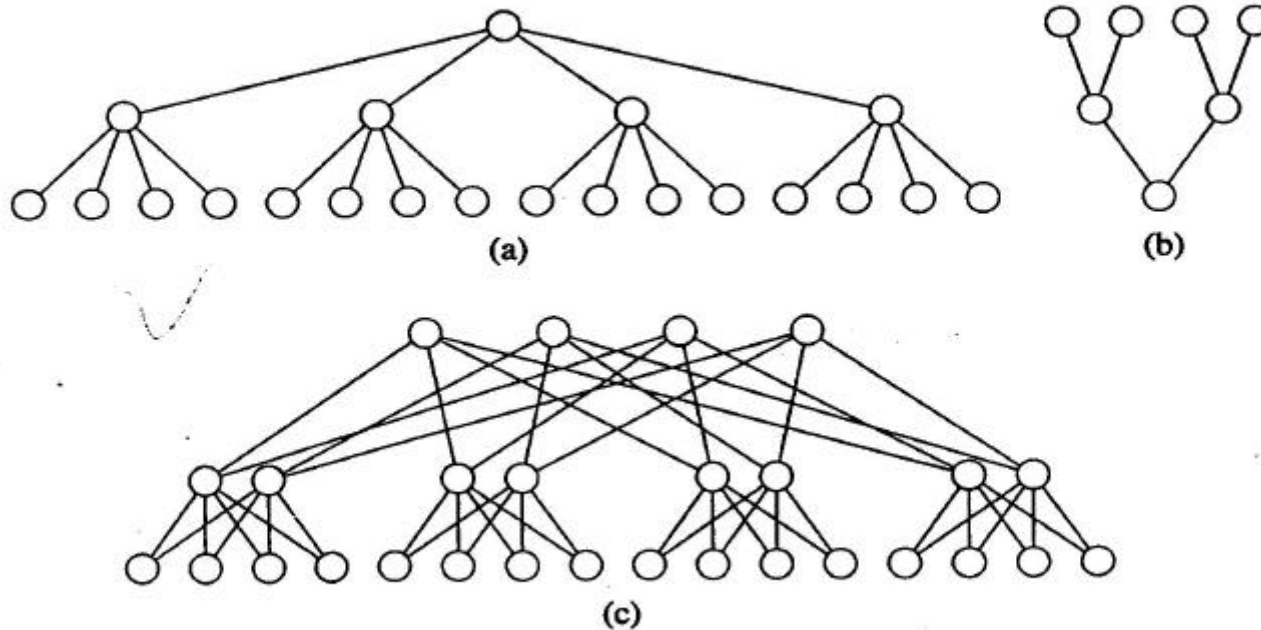- Maximum edge length

Mesh Network

(a) (b) (c)

FIGURE 3-1 Two-dimensional meshes. (a) Mesh with no wrap-around connections. (b) Mesh with wrap-around connections between processors in same row or column. (c) Mesh with wrap-around connections between processors in adjacent rows or columns.
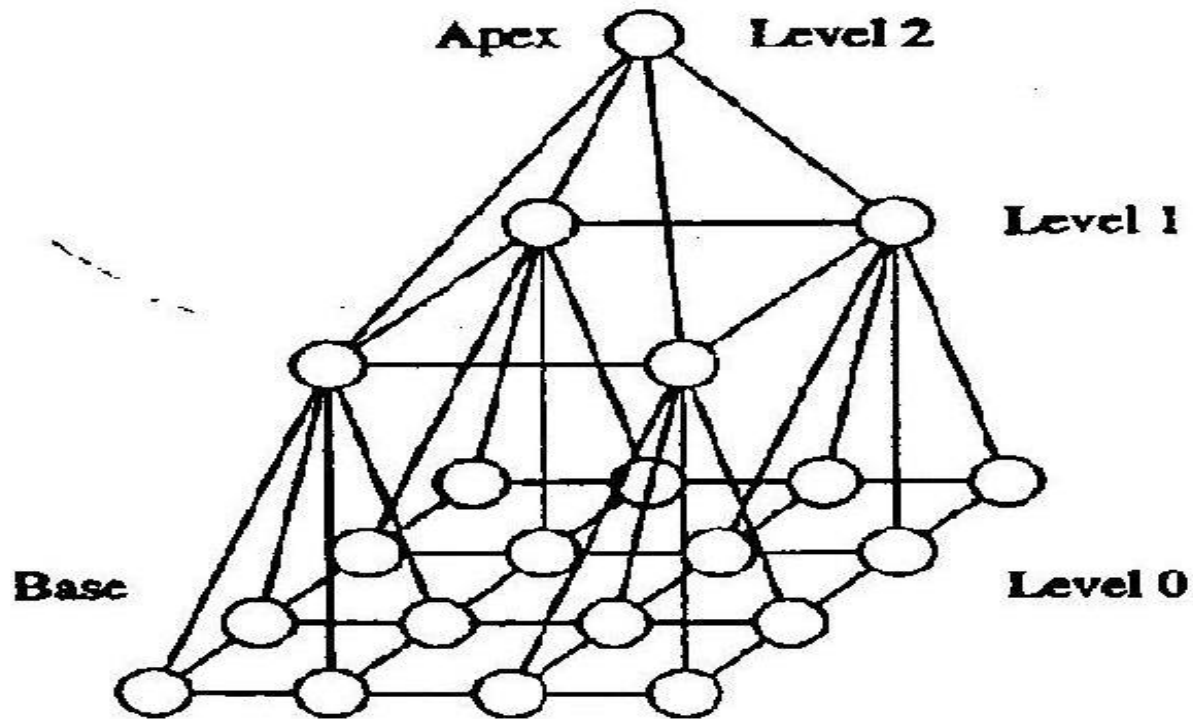
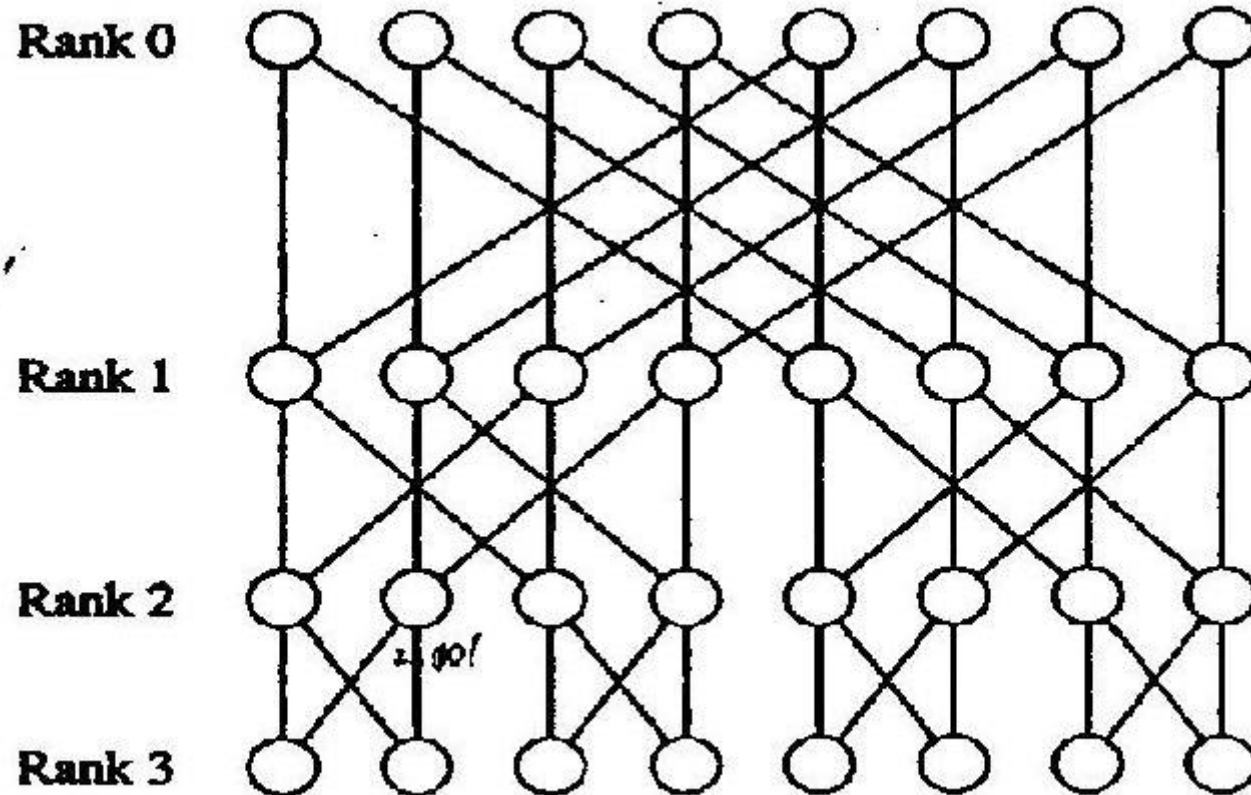# Binary Tree Network

Hypertree Network

FIGURE 3-3   Hypertree network of degree 4 and depth 2. (a) Front view. (b) Side view. (c) Complete network.

(a)

(b)

(c)

Pyramid Network

Butterfly Network

Hypercube Network
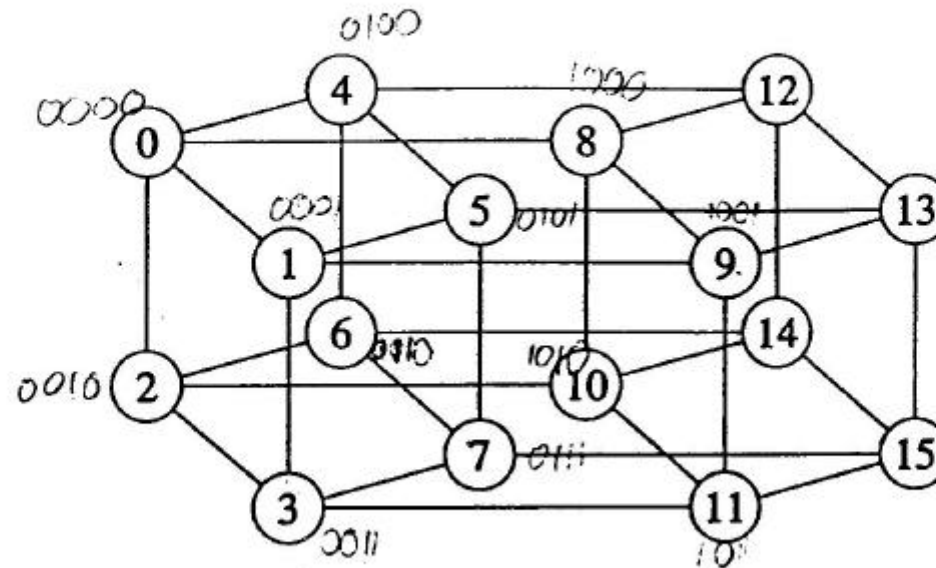

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FIGURE 3-6 A four-dimensional (16 node) hypercube.
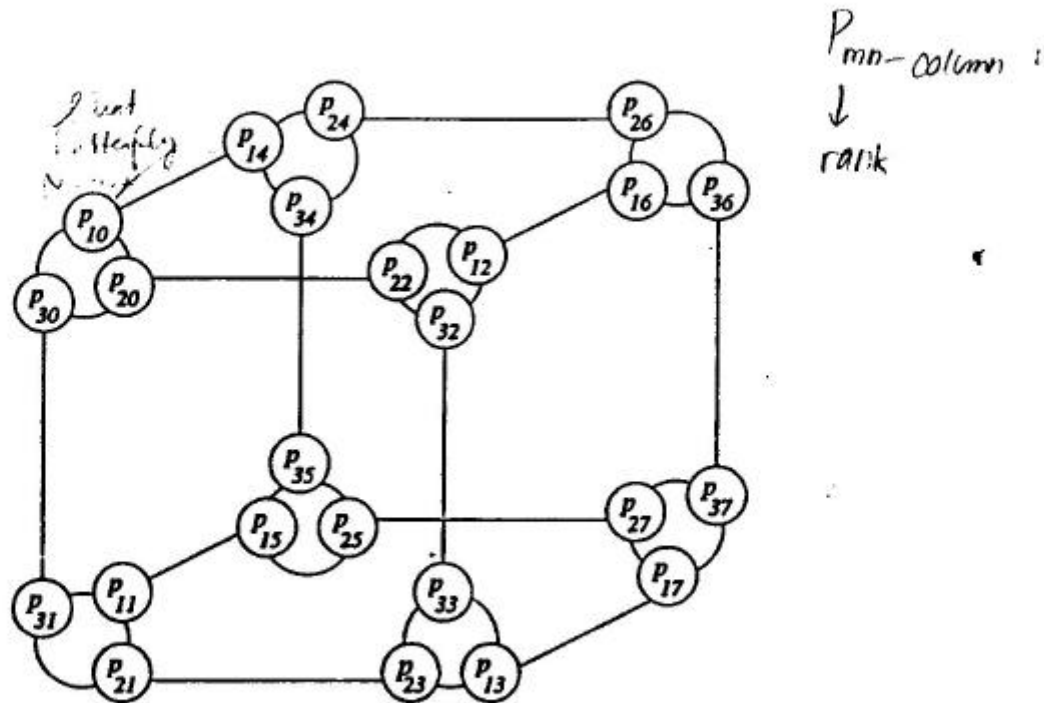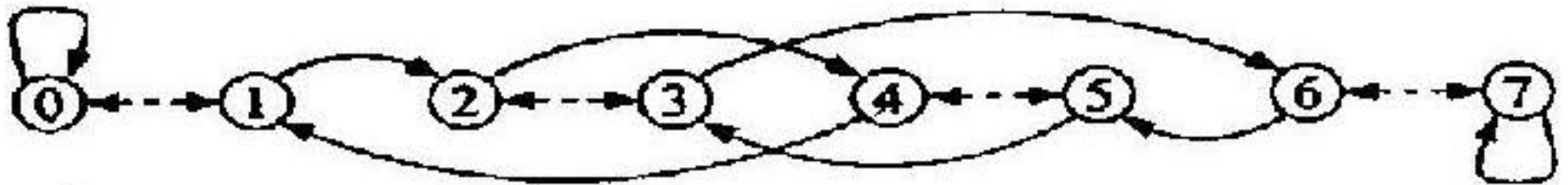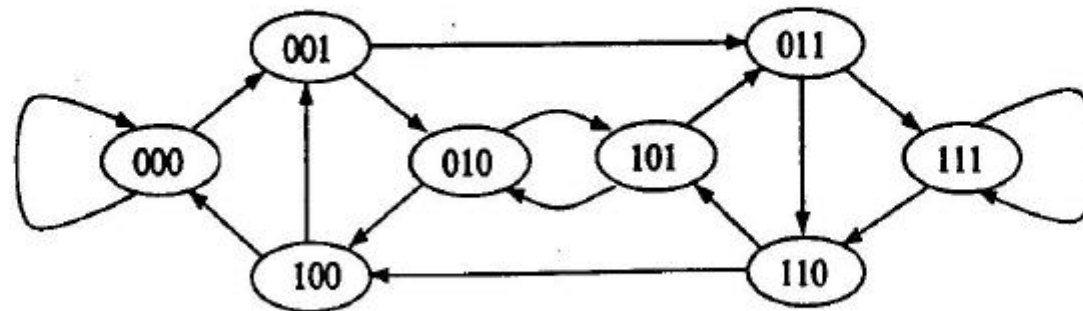
Cube Connected Cycles Network

FIGURE 3-7 Cube-connected cycles network with 24 nodes. The first subscript of each node denotes the rank; the second subscript of each node denotes the column.

Shuffle Exchange Network

De Bruijn Network

FIGURE 3-10 An 8–processor de Bruijn network.

Karakter setiap Organisasi Prosesor

TABLE 3-1 CHARACTERISTICS OF VARIOUS PROCESSOR ORGANIZATIONS

Network	Nodes	Diameter	Bisection Width	Constant Number of Edges	Constant Edge Length
1-D mesh	k	$k-1$	1	Yes	Yes
2-D mesh	k^2	$2(k-1)$	k	Yes	Yes
3-D mesh	k^3	$3(k-1)$	k^2	Yes	Yes
Binary tree	2^k-1	$2(k-1)$	1	Yes	No
4-ary hypertree	$2^k(2^{k+1}-1)$	$2k$	2^{k+1}	Yes	No
Pyramid	$(4k^2-1)/3$	$2\log k$	$2k$	Yes	No
Butterfly	$(k+1)2^k$	$2k$	2^k	Yes	No
Hypercube	2^k	k	2^{k-1}	No	No
Cube-connected cycles	$k2^k$	$2k$	2^{k-1}	Yes	No
Shuffle-exchange	2^k	$2k-1$	$\geq 2^{k-1}/k$	Yes	No
de Bruijn	2^k	k	$2^k/k$	Yes	No