N/w Interconnects: Measures and Topologies

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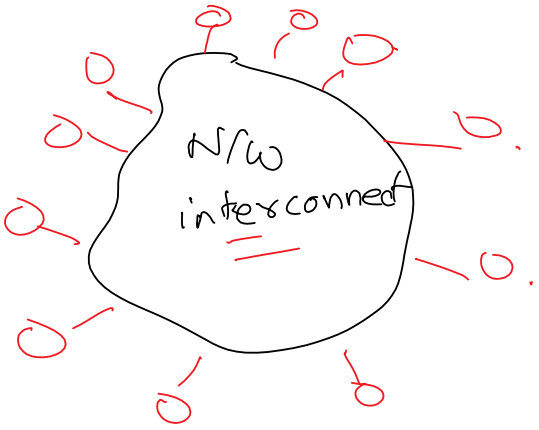
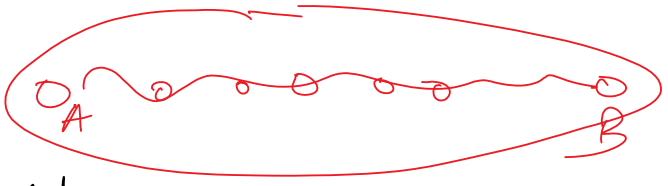


Measures:

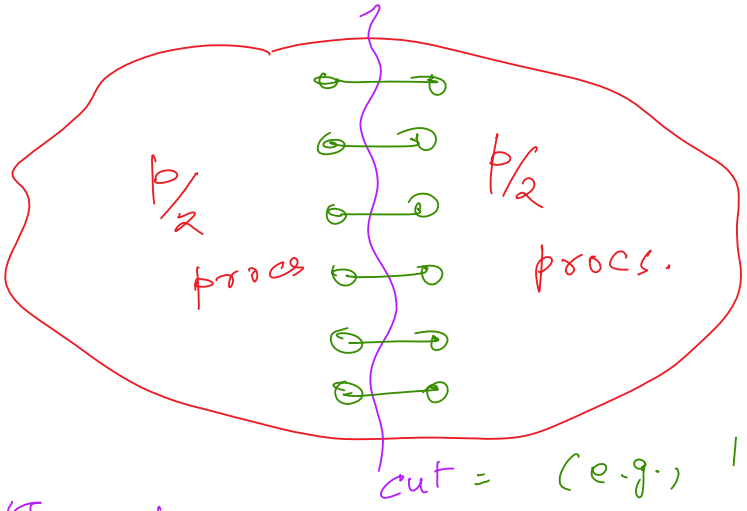
a) Diameter: ← smaller the better.

length of the longest shortest path in the N/w.



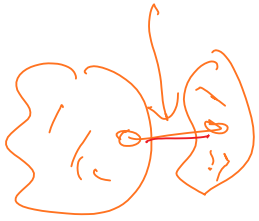
b) Bisection Bandwidth:

The minimum number of links to cut that would divide the network into two halves.



p procs.

cut = (e.g.) 1 link



> larger the bis. b/w, the larger the N/w concurrency

↑ high is good!

Measures:

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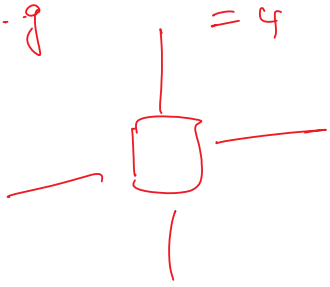
c) Number of links per node: (LPN) (for short)

How many links are physically attached to a single node?

e.g # links per node = 4



$1 \leq$ links per node $\leq (p-1)$ Theoretical limit

What is desirable?

⇒ larger the LPN, the more connectivity there is to each node.

But, scaling up becomes harder : physical limitations allow for a small constant (usually $\ll p-1$)

⇒ Therefore, we will prefer a network topology that has {a low LPN} and {a high bisection bandwidth}