

Adaptive networks

Department of computer science and technology.

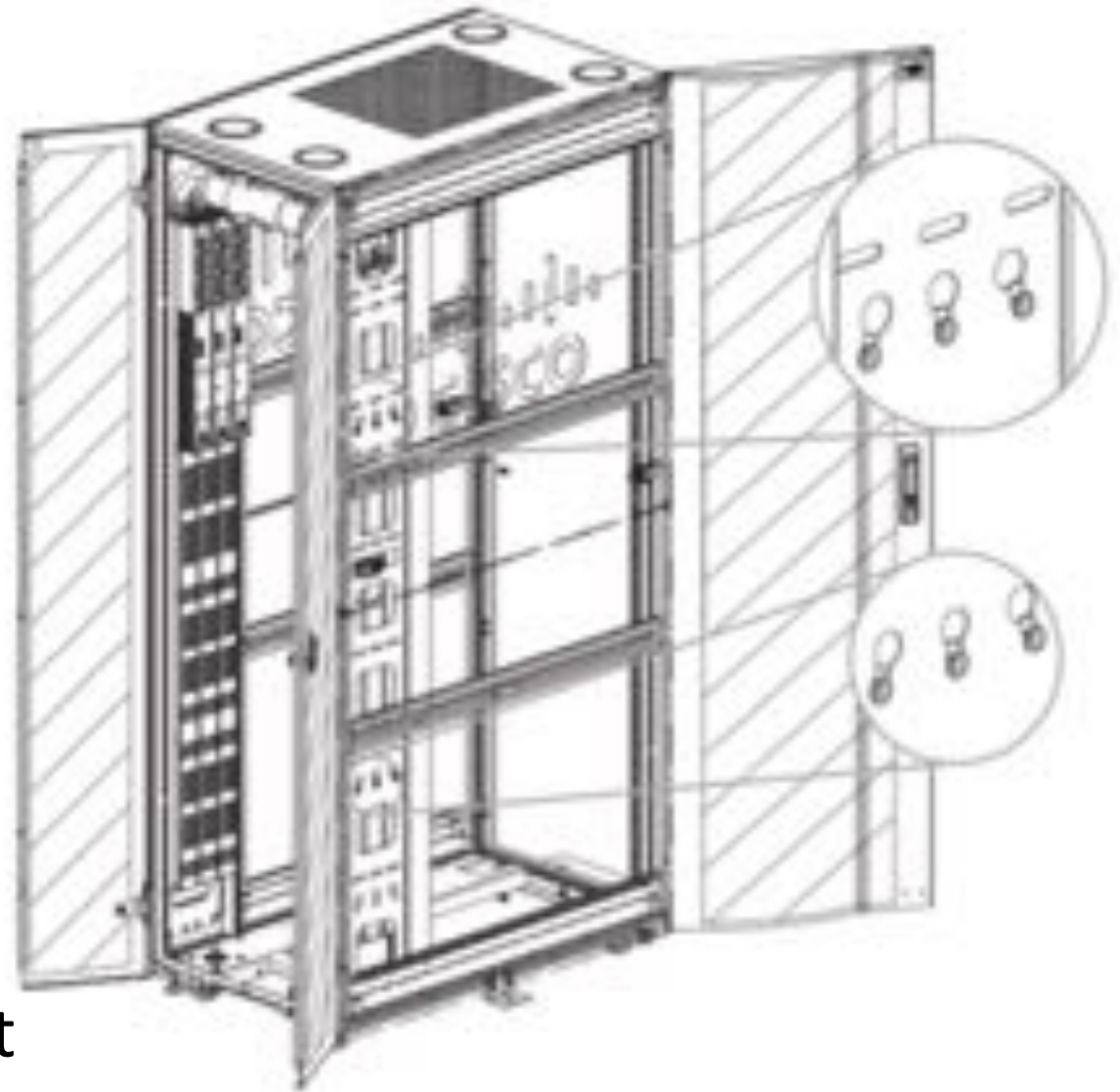
This work was partly funded by Microsoft Research through its PhD Scholarship Programme.

Goals

- Rack-scale systems
- Review some new phy innovations
- Talk about data centres
- Putting it all together

In the beginning ...

- A rack was just a metal box
- Physical dimensions...
- Power budget...



Rack and power – Open Compute Project

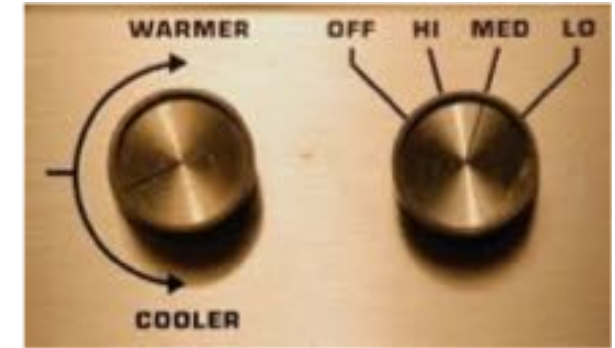
No “one size fits all” server configuration

- In **compute**-dense applications: unused memory ,HDD, expansion slots
- In **memory**-dense applications: unused expansion and HDD slots waste server “real estate”.
- In **storage**-dense applications: CPUs and memory might be overprovisioned.

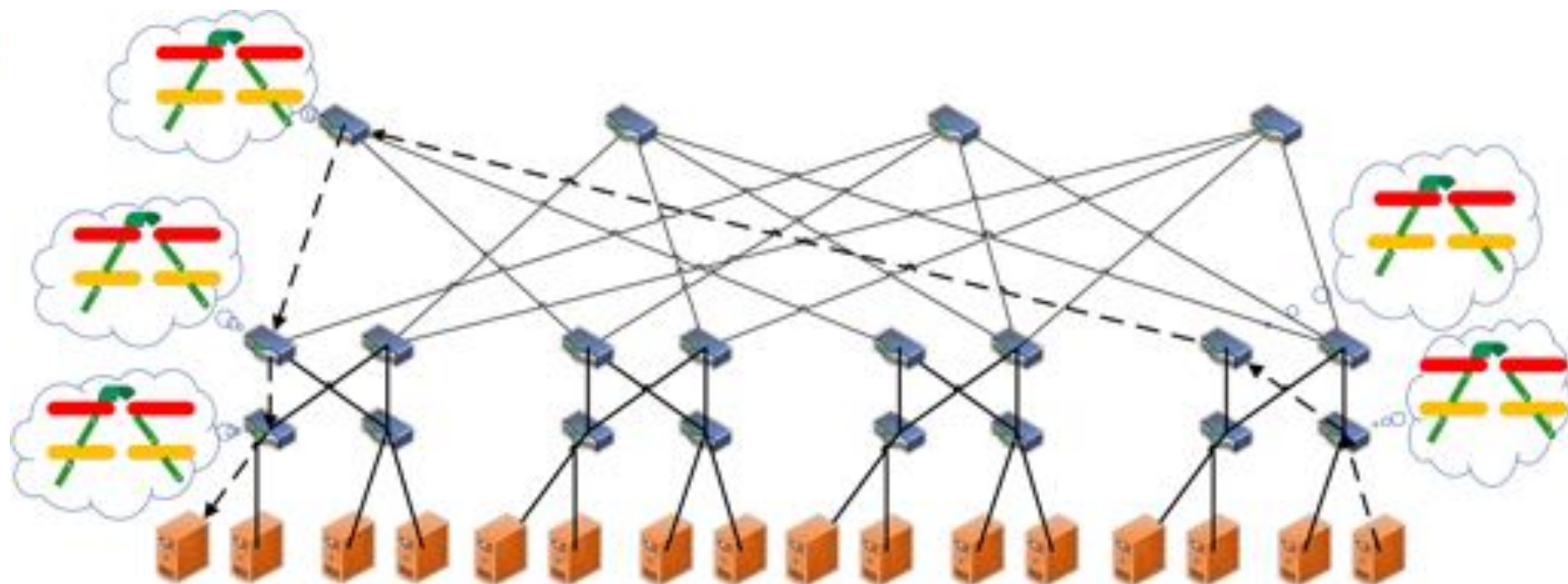
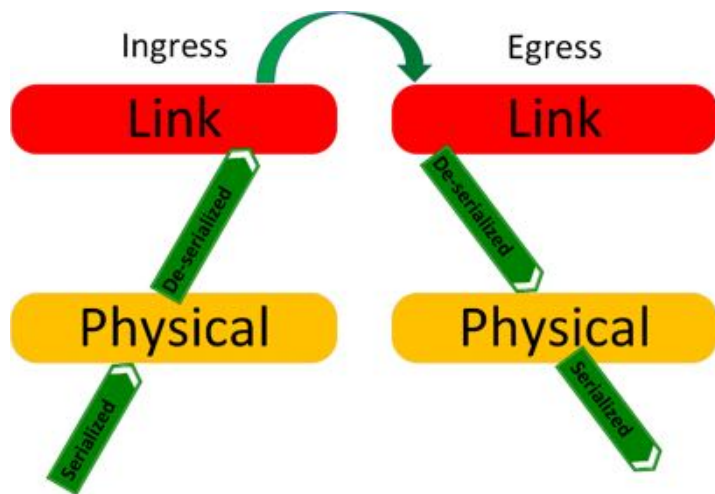


From the interconnect point of view

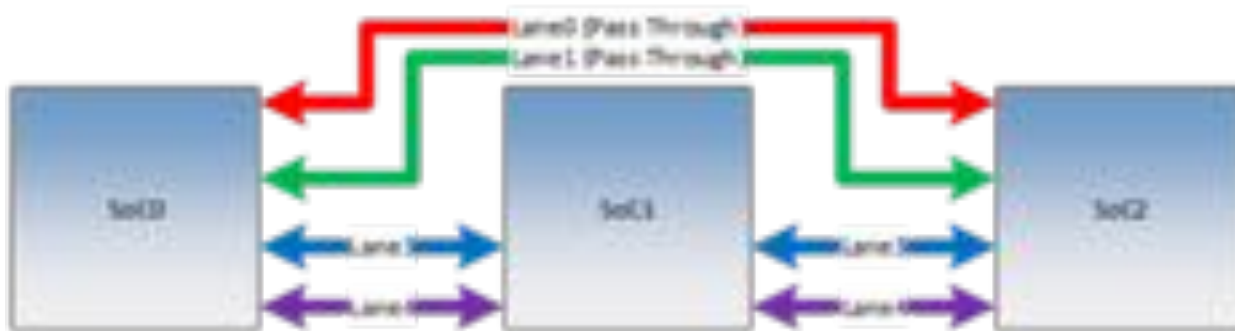
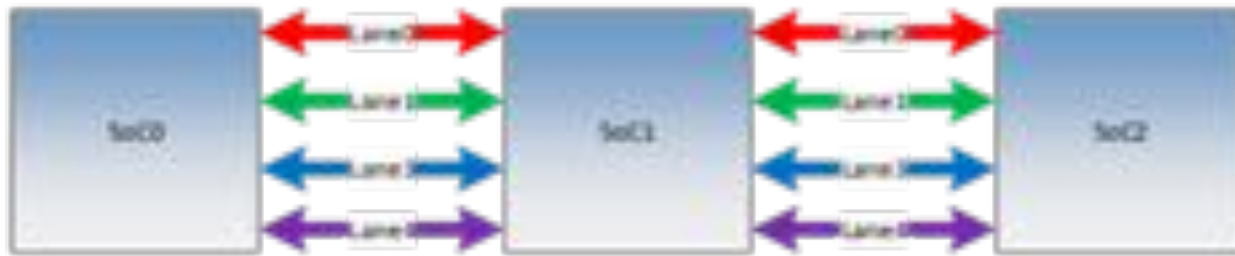
- A static topology is a fixed power drainer.
- Power is a constraint on the interconnect.



Where can we save power ?



High speed bypass



Caveats:

- Signal integrity.
- Configuration time.
- FEC
- **Adoption in DC ?????**

And the wonderful shape of other things

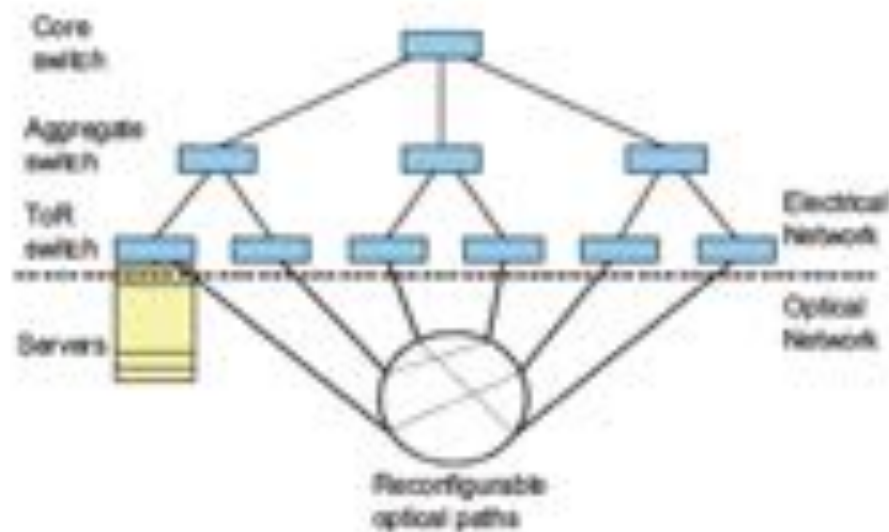
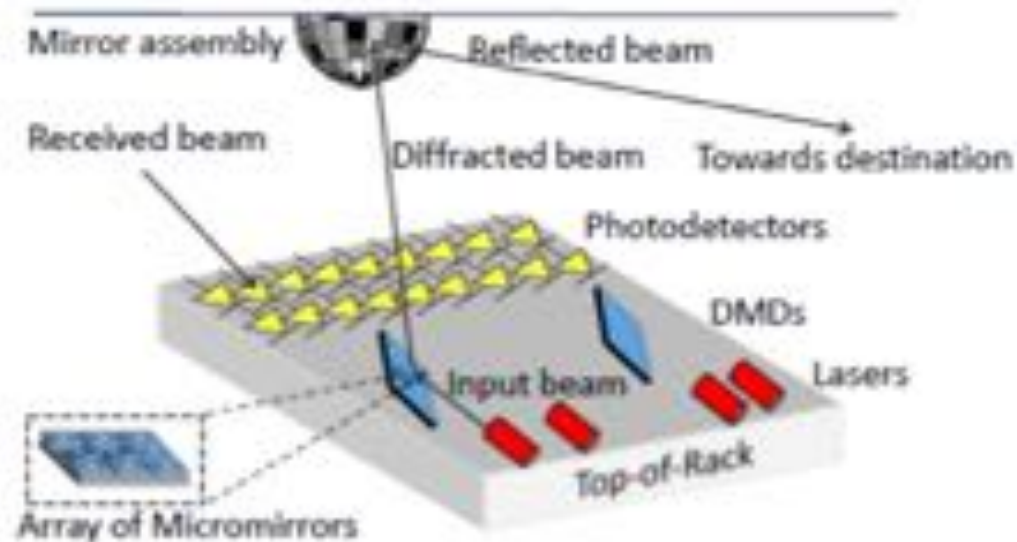


Figure 1: HyPaC network architecture

cThrough

projecToR



Abstraction and layering



Pacing mechanism
of NDP ?

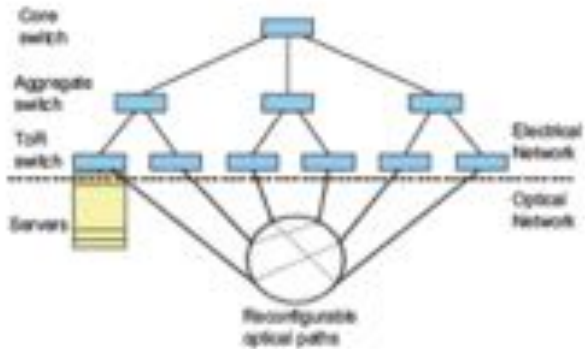


Figure 1: HyPaC network architecture

