What Keeps Your Network up at Night?

What keeps your network up at night?

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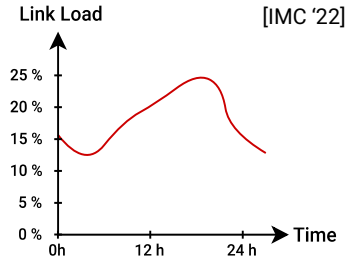
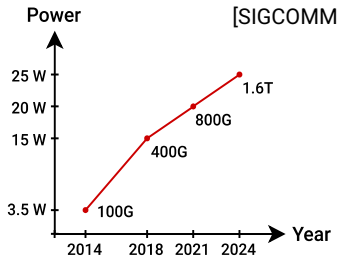
Observation

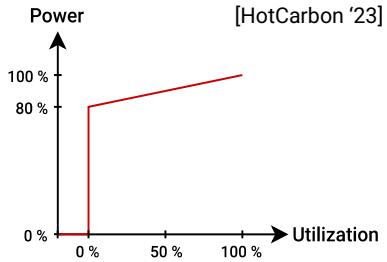
Network links are underutilized, power-hungry and inefficient



Avg. link load in networks is low



Power per transceiver is increasing



Low utilization is bad for efficiency

Theory

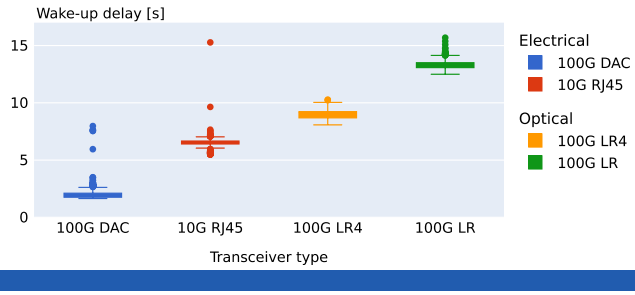
Save energy with sleeping and buffering

Assumption: Transceiver ready within milliseconds

[NSDI '08]: Buffer traffic while transceivers wake up

Practice

Transceiver wake-up takes seconds!

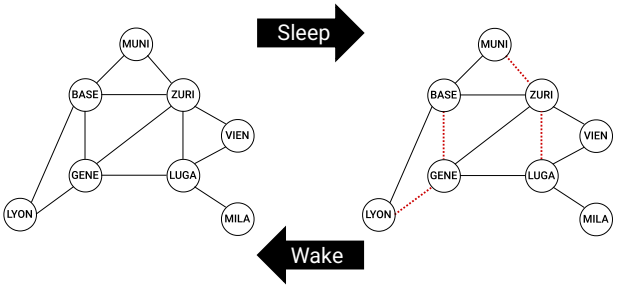


Contribution

Turning links off still works when considering longer timeframes

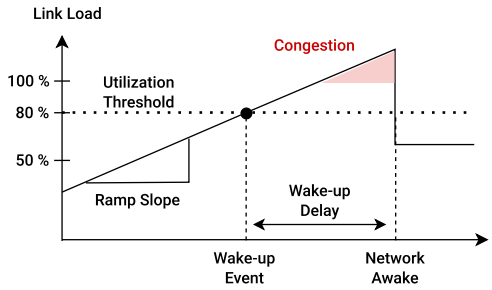
Learn more:

The controller turns off non-essential links



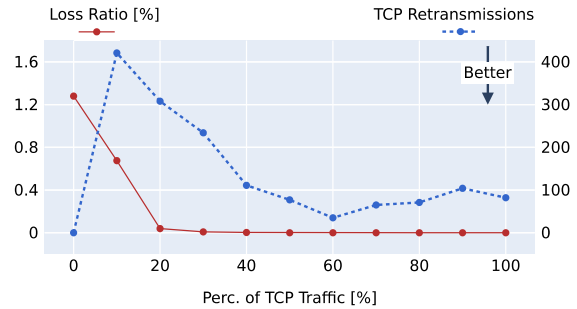
Nodes wake up the network if the load is too high

No disruption to the network
if the traffic doesn't change too fast



Result

TCP limits the impact of congestion
if traffic changes too fast



Future

Faster wake-up boosts energy savings
and reduces performance impact