

Cutting the Electric Bill for Internet-Scale Systems

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1: Summary

This paper again deals with methods of efficiency in large scale data centers. An important aspect that this paper properly makes clear is that its looking to optimize cost, not necessarily the energy efficiency. It may seem that these are the same thing, however what they show is that since datacenters and networks are spread out geographically along with the fact that power prices are constantly changing that we should move workload to those lower cost areas. They assume that the infrastructure for this is already set up. In most cases, it is because companies want to be able to shift load to other server in cases of shutdowns or other problems. The paper proposes to use that same infrastructure for rerouting and use it to save money.

But, this cost saving is highly dependent on many factors. First it is dependent on energy elasticity. Meaning when we reduce the work load on a datacenter, we want to see a significant drop in power consumption. Otherwise, our methods would be useless because it would have little effect to shift load. It also says that this will work better on larger scale than smaller scale systems.

Now how they measure what kind of saving they could achieve is similar to what other research project with non-feasible implementation do. The measured realtime datacenter traffic and next to that they measure realtime energy price fluctuations in various geographic location. 29 different locations. These prices can fluctuate hourly and surprisingly there are significant differences between them.

2: Strengths

- Datacenter might adopt this because it requires nothing more than rerouting software/algorithms
- Infrastructure is already built

3: Weaknesses

- Add latency to transactions
- This is messing with economic markets
- Power companies are gonna adapt
- The prices are changing due to realtime markets so if everyone is doing this, its not going to work

4: Future Directions

- Collaborate with many companies (Googe, Microsoft, Akamai, etc.) and this can make this optimization better for everyone
- The problem is people don't want to share (secretive)