Autocloud, or how to use your car battery to save energy!

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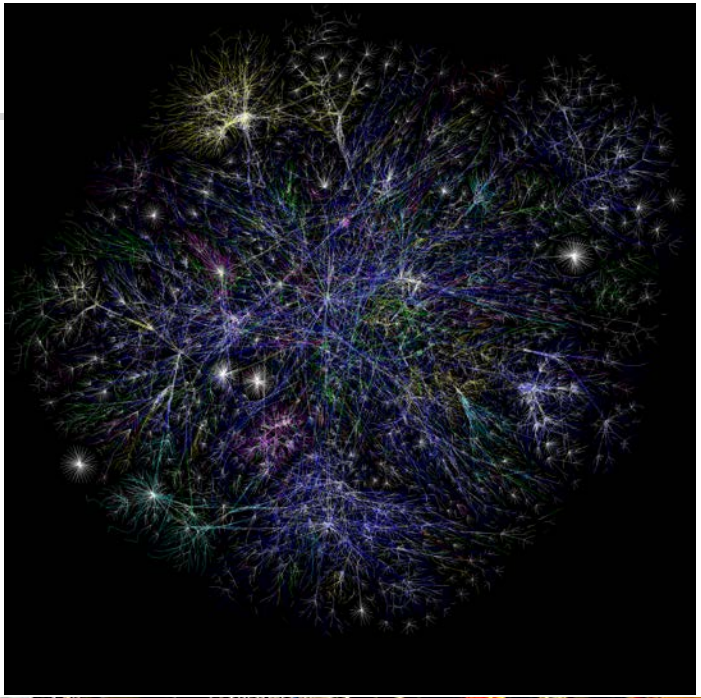
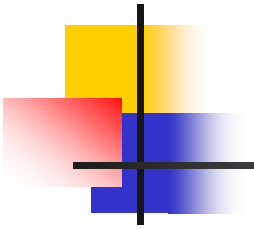
The Wires run hot



Assume all our vehicles are electric

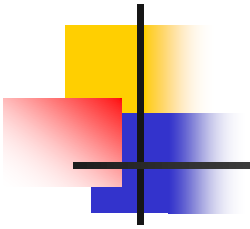
- That represents storage for about 30% of UK electricity production for a day
- The Internet is using between 5&10% of electricity 24*7

- Is there some way to make good use of all that energy storage in parked cars?



Idea - distribute cloud to every car

- Lots of small data centers in car boot
  - Can deliver service locally (lower latency)
  - Can use microgenerated power locally (when not being used to charge car)
  - Can use battery power, when microgeneration being sent up to the grid
- Can run MORE computers for LESS energy
  - Because they can run at lower speed (half speed is 4 times less power…)
  - They use green energy
  - They use off peak energy
  - They use energy otherwise lost in up-grid transmission

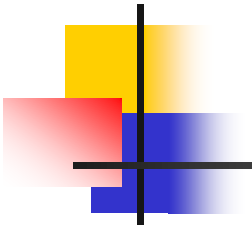


How big is a small data center?

- There are ~1,000,000 CPUs in a big one
- Today's rack mounted system might be 4-16 core
- But tomorrow, see 1000 core (ARM)
- So 10% of big data center in car boot
- Smaller than battery

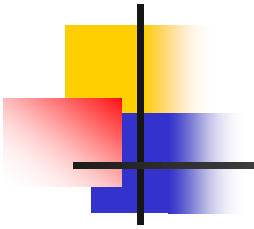
Need to plug fiber as well as copper

- Copper to charge/discharge battery
- Fiber to charge/discharge data
  - Could also connect data via wireless HDMI (6-7Gbps)
  - Or ultra-wideband over powerline:)
- Could also usefully plug in heat exchanger:)
- Battery + Microgeneration is equivalent to time and space shifting power generation/consumption
- Data Store/CPU in car also lets you do spatial&time shifting of Cloud



Allow for battery life redux

- So if we discharge the battery
  - To run the cloud,
  - We might half the battery life
- Need to allow for this in calca
  - Doesn't make much of a difference really
    - In fact, decentralizing the cloud gets rid of the heat dissipation problem
    - reducing power consumption (PUE) by 30-40% right away



Take Homes

- We can make the web/cloud/internet green
- We can do it by distributing it into cars
- If microgeneration and car batteries combined
  - Combined bits and power
  - Combined heat+data
- Could look at regenerative breaking to spin up the disks too:)

- Could call it:
  - Time And Relative Dimensions in Computer Engineering
    - (TARDICE:)
  - or
    - Saving Cycles in Your Garage