"Project Greenlight: Optimizing Cyberinfrastructure for a Carbon Constrained World"

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Abstract:
This year marks a turning point in the debate on global climate change in which the focus is rapidly moving from a scientific analysis of how human activity effects climate change to a political process on how best to regulate greenhouse gas (GHG) emissions. The global Information and Communication Technology (ICT) industry produces GHGs equivalent to that produced by the aviation industry (~2-3 %). Furthermore, the ICT sector's emissions will nearly triple, in a business as usual scenario, from 2002 to 2020.

On the other hand, the Climate Group estimates that transformative application of ICT to electricity grids, logistic chains, intelligent transportation and building infrastructure, and other social systems can reduce global GHG emissions by ~15%, five times ICT's own footprint! I will discuss two campus testbeds for exploring these complex tradeoffs.

The NSF-funded GreenLight Project (http://greenlight.calit2.net), deployed at UCSD, creates an instrumented data center which allows for detailed real time data measurements of the critical subcomponents and then making that data publically available on the web so that the results can guide users who wish to lower the energy cost of computation and storage.

The second testbeds are the UCSD and UCI campuses themselves, which are functionally small towns with their own power grids, commuter transportation systems, hospitals, and populations in the tens of thousands and so are at-scale Green IT testbeds. Calit2 is working with campus administration, faculty and staff to instrument these campuses as Living Laboratories of the Green Future.