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Tasks Scheduling in Cloud Datacenters Under Renewable Power Constraint

Datacenters are now known to be one of the biggest actors when talking about energy consumption (about 1.3% of world's electricity consumption). Other studies point that datacenters are consuming more energy than the entire United Kingdom, and our needs are increasing. In order to improve this scenario some projects try to supply the datacenters electricity with renewable energy sources and storage elements. Nevertheless, due to the intermittent nature of these power sources, most of the works still rely on grid as a backup.

Our research, which is part of the ANR DATAZERO project, aims to optimize the IT scheduling to execute tasks considering as workload a mix of batch tasks and services, and the several moments where renewable energy could be dispatched by the power side. The scheduling is performed without the power grid as backup, where all energy must come from renewable energy sources only.

The aim of the presentation is to show: (i) how we modeled and generated this mixed workload (batch and services); (ii) the different approaches/algorithms considered for the tasks scheduling with such an intermittent power distribution; and (iii) the results obtained so far and the next steps of our research.

References:

Stephane Caux, Gustavo Rostirolla, Patricia Stolf. Smart Datacenter Electrical Load Model for Renewable Sources Management. International Conference on Renewable Energies and Power Quality (ICREPQ 2018), Salamanca, Spain, April 2018.

Stephane Caux, Paul Renaud-Goud, Gustavo Rostirolla, Patricia Stolf. IT Optimization for Datacenters Under Renewable Power Constraint. Euro-Par, Turin, August 2018.