

Portugal, EE-07-2016-2017

Several of the most important issues in the development of policies in data centers entail complex decisions about the management of resources. Making such decisions optimally, or nearly optimally, presents significant computational challenges that require the development of new algorithms and software tools designed to optimize data center operations.

As cloud-based services become ubiquitous, more and more computation is being carried out in data centers. As a result, the necessary infrastructure (servers, switches, air conditioning, etc.) in data centers has grown tremendously.

Our competences are focused on the development of algorithms and software tools for solving combinatorial optimization problems in real-world scenarios. In the context of data centers, these problems arise in many different levels. For instance, at the management of servers there are several problems that can be solved, such as virtual machine consolidation and placement, among many other. At the management of the network infrastructure, tools for software defined networks are crucial and we have the competences to be a major contributor in these areas.

We have developed several effective and robust general purpose software tools for single-criteria and multi-criteria optimization problems. These tools can be directly used or adapted to efficiently solve real-world problem. For instance, we have developed models and tools to tackle biological problems, software upgradeability problems, among many other. Currently, we are working very actively in server management (virtual machine placement and consolidation) for minimizing the overall use of energy in data centers. Furthermore, we are also changing our tools to tackle problems in software defined networks.

Our software tools are ready to be deployed, as an extensive community uses them, providing a valuable feedback in its maintenance and improvement.

Topics

EE-07-2016-2017:

Behavioural change toward energy efficiency through ICT

EE-20-2017:

Bringing to market more energy efficient and integrated data centres

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Organisation: Research Organization