

Resource Management for Cloud Computing using Computational Social Choice

Código do projeto: DC01

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Linha de pesquisa: Gestão e Desenvolvimento de Sistemas

Número de vagas: 1

Descrição

Resource management on Cloud Computing platforms involves several facets of how CPUs and other computational resources are shared among users.

From the Cloud Computing provider point-of-view, Virtual Machines (VMs) must be assigned to the appropriate physical resource. The choice must take into account the expected workload, Virtual Machines already assigned to the machine, the current CPU and memory loads, VM's and I/O patterns, etc. End-users face resource management choices as well. Users of public platforms must choose between different cloud providers, different resources configurations and capabilities (VM, network, storage), different SLA guarantees, etc. All those choices have a significant impact on the performance perceived by the users and, more importantly, on the total price paid by the user.

Some of the resource management choices faced by both cloud providers and end-users have an intrinsic sense of prioritization: there are some options better than others according to some criteria, but all of them cover the needs. For instance, two equally suited VMs may differ on their prices or cache-size. Assigning those VMs to users based on their preferences is a time-consuming operation, especially for large sets of different (equally good) options. Those preferences are not properly differentiated by traditional resource management algorithms.

Algorithmic Game Theory and, more recently, Computational Social Choice are branches from Applied Mathematics that have been used to model some of the resource management problems that appear on Cloud Computing. In this project, we will study the use of the classical game theoretical concept of Stable Matching to model resource management problems on Cloud Computing where independent, selfish agents must choose between options with different priorities.

Perfil desejado

Egressos de cursos da área da Computação (Sistemas de Informação, Ciência da Computação, Eng. de Computação ou correlatos) com excelente histórico escolar em disciplinas relacionadas à Matemática Discreta e fluência em inglês.

Referências

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