Séminaire ASTRE : Tarek Menouer

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Titre du séminaire et orateur

Scheduling and Allocation Framework for Containers in a Cloud Environment.

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Abstract

Nowadays, different forms of cloud computational resources exist such as virtual machines (VMs), containers, or bare-metal resources, having each their own characteristics. VM technology has changed the face of modern computing as improving the system utilization and the isolation of applications. Nevertheless, VM utilization can sometimes be difficult to achieve, e.g. when the applications to be run do not consume all resources of a VM. However, container are rapidly replacing VM as virtual encapsulation technology to share physical machines. The advantage of containers over VMs are a much faster launching and termination time overheads, and an improved utilization of computing resources. In the context of containers, we introduce a new Scheduling and Allocation Framework for Containers (SAFC). SAFC is based on an economic model proposed for cloud environment. The goal is to propose a framework which dynamically schedule containers, and decide for each one the number of resources that must be allocated. For the CPU resource, the decision is based on a hard and soft min/max bounds of cores. The hard bound is set according to the economic model and the configuration of the cloud parallel machines. Moreover, the soft bound is set according to the load of cloud parallel machines. The strength of SAFC, compared to traditional containers scheduling systems, is that the number of resources allocated by SAFC to each container is flexible and decided on the fly. This flexibility allows SAFC to control the global scheduling of all submitted containers and to manage the peaks of activities. SAFC is evaluated using the Linux Containers (LXC) inside the Grid5000 testbed.