Performance Analysis of Multi-Tenant Systems

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2019-11-16

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1 Introduction

Efficient virtualization techniques have enabled rise of multi-tenant cloud providers which optimize costs by sharing multiple physical resources between more users and create virtual isolation between them. Isolation is needed to enforce fair usage of resource, accounting and security. Tenants don't have direct access to other tenants nor see their workload / data. There are many ways how to provide isolation on different levels of stack. For example isolation at the application level can be provided by multiple databases in DBMS and setting proper access controls. Isolation at the user space level can be provided by containers where programs are isolated in user space, however their share kernel. This isolation is guaranteed by the kernel itself. Isolation at the operating system can be provided by virtualization engines such as KVM + QEMU or Virtualbox where the whole hardware is virtualized and we have separate operating systems running on top of virtualization engine. All these isolation techniques have different impact on performance. In this project the toll of isolation is investigated from the point of real users by asking a question: How competing for resources between tenants affects performance of the workloads.

It has already been show that antagonist applications can affect other workloads even when isolation is in place (**?**).