

COMPUTER SCIENCE RESEARCH SEMINAR

Live Migration Ate My VM: Recovering a Virtual Machine
After Migration Failure

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Abstract: Virtualization has been widely adopted in cloud computing environments to improve server consolidation and reduce operating cost. Live migration of Virtual Machines (VM) is a key technique to quickly migrate workloads in response to events such as impending failure or load changes. Existing live migration mechanisms aim to move VMs as quickly as possible and with minimal impact on the applications and the cluster infrastructure. Two pre-dominant live migration mechanisms underlie all migration techniques: pre-copy and post-copy. The two techniques differ in whether a VM's CPU execution state is transferred before or after the transfer of its memory pages.

An important consideration in live VM migration is the robustness of the migration mechanism itself. Specifically, the source, the destination, or the network itself can fail during live migration. Since a VM encapsulates a cloud customer's critical workload, it is essential that the VM's state is preserved accurately and not lost due to failures during migration. In both pre-copy and post-copy, the failure of the source node during migration results in a permanent loss of the VM because some or all of the latest state of the VM resides at the source during migration. In this talk, we present techniques to recover a VM after a failure during post-copy live migration. We implement and evaluate our approach in KVM/QEMU platform and show that the total migration time of post-copy remains unchanged while maintaining low failover time, downtime, and application performance overhead.

Bio: Dinuni Fernando is a Ph.D candidate at Binghamton University advised by Dr. Ping Yang and Dr. Kartik Gopalan. Her current work focuses on resilience in live migration, SDN based migration, and blockchain. Her research interests include virtualization, networks and security.

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Refreshments will be provided!