

**CHENNAI – PONDICHERRY**

**LIVE VM MIGRATION UNDER TIME-CONSTRAINTS IN**

**SHARE-NOTHING IAAS-CLOUDS**

**Abstract:**

Live VMmigration helps attain both cloud-wide load balancing and operational consolidation while the migrating VMs remain accessible to users. To avoid periods of high-load for the involved resources, IaaS-cloud operators assign specific time windows for such migrations to occur in an orderly manner. Moreover, providers typically rely on share-nothing architectures to attain scalability. In this paper, we focus on the real-time scheduling of live VM migrations in large share-nothing IaaS clouds, such that migrations are completed on time and without adversely affecting agreed-upon SLAs. We propose a scalable, distributed network of brokers that oversees the progress of all on-going migration operations within the context of a provider. Brokers make use of an underlying special purpose file system, termed MigrateFS, that is capable of both replicating and keeping in sync virtual disks while the hypervisor livemigrates VMs (i.e., RAM and CPU state). By limiting the resources consumed during migration, brokers implement policies to reduce SLA violations while seeking to complete all migration tasks on time. We evaluate two such policies, one based on task prioritization and a second that considers the financial implications set by migration deadline requirements. Using our MigrateFS prototype operating on a real cloud, we demonstrate the feasibility of performing migrations within time windows. By simulating large clouds, we assess the effectiveness of our proposed broker policies in a share-nothing configuration; we also demonstrate that our approach stresses 24 percent less an already saturated network if compared to an unsupervised set up.