

## Generic costing scheme using general equilibrium theory for fair cloud service charging

### ABSTRACT

Cloud Service Providers (CSPs) enable their users to access Cloud computing and storage services from anywhere in quick and flexible manners through the Internet. With the basis of 'pay-as-you-go' model, it makes the interactions between CSPs and the users play a vital role in shaping the Cloud computing market. A pool of virtualized and dynamically scalable Cloud services that delivered on demand to the users is associated with guaranteed performance and cost-provisioning. It needed a costing scheme for determining suitable charges in order to secure lease pricing of the Cloud services. However, it is hard to meet the satisfied prices for both CSPs and users due to their conflicting needs. Furthermore, there is lack of Service Level Agreements (SLAs) that allowing the users to take part into price negotiating process. The users may lose their interest to use Cloud services while reducing CSPs profit. Therefore, this paper proposes a generic costing scheme for Cloud services using General Equilibrium Theory (GET). GET helps to formulate the price function for various services' factors to match with various demands from the users. It is initially determined by identifying the market circumstances that a general equilibrium will be hold and reached. Specifically, there are two procedures of agreement made in response to (i) established equilibrium supply and demand, and (ii) service price formed and constructed in a price range. The SLAs in our costing scheme is integrated to satisfy both CSPs and users' needs while minimizing their conflicts. The price ranging strategy is deliberated to provide prices' options to the users with respect their budget limit. Meanwhile, the CSPs can adaptively charge based on users' preferences without losing their profit. The costing scheme is testable and analyzed in multi-tenant computing environments. The results from our simulation experiments demonstrate that the proposed costing scheme provides better users' satisfaction while fostering fairness pricing in the Cloud market.

**Keyword:** Cloud services; Costing scheme; General equilibrium theory; Price fairness; Multi-tenant environment