

**CHENNAI – PONDICHERRY**

**Quality and Profit Assured Trusted Cloud Federation Formation: Game Theory Based Approach**

**Abstract**

With more awareness and growth in the cloud market, demands for computational resources have increased in order to provide services to the cloud users. Sometimes it is difficult for an individual cloud service provider (CSP) to meet the level of promised quality of service (QoS) and to fulfill all types of resource requests dynamically. Cloud federation has become a consolidated paradigm in which group of cooperative CSPs share their unused resources with peers to gain some economic benefit. Hence, the cloud federation overcomes the limitation of each CSP for maintaining QoS during sudden spikes in resource demand. However, the presence of untrusted CSPs degrades the QoS of the services delivered through federation. Trusted CSPs are highly reputed in the federation as they can extend their resources and services to maintain the level of committed QoS by the member CSPs of the federation. Therefore, to guarantee delivery of committed QoS, it will be necessary to form a federation with trusted CSPs only. In this paper, we present a broker based cloud federation architecture. The cloud federation formation is modeled as a hedonic coalitional game. The main objective of this work is to find the most suitable and stable federation of trusted CSPs that will maximize the satisfaction level of each individual CSP on the basis of QoS and profit. The proposed coalitional game inspired cloud federation formation (CGCFF) algorithm has been extensively compared with selected existing techniques. Simulation results show that the set of federation formed by CGCFF is Nash-stable and performs better than these techniques in terms of satisfaction, quality and profit.