

# Abstract

*The cloud computing grown as an internet-based paradigm that has captured the interest of both business and academic communities to deliver IT resources as internet-based services to the end users. One of the most attractive aspects of cloud computing is its elasticity, which allows cloud platforms to manage workload fluctuations. When a user requests for computing resources, the cloud service provider assigns essential resources, including CPU and RAM, to the user in a suitable amount for their needs. However, the cloud platforms may experience issues with over- or under-provisioning if the elasticity feature is improperly managed when resource requirements rise as a result of an increase in the number of accesses and workload. Because of this, managing resource elasticity is one of the important issues that must be considered in the context of cloud computing. In this study, we propose an elasticity controller, to manage cloud infrastructure automatically and dynamically, based on Timed Colored Petri Nets(TCPN). CPN tool is used for formal analysis and simulation to validate the proposed CPN model. State-Space analysis is performed to check the behavior of proposed model and performance analysis is conducted to check the accuracy of model.*