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BN-based approach for predictive admission control of cloud services
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Abstract
A phenomenal growth in the demand for Cloud Computing services by the cloud consumers has necessitated the efficient and proactive management of the data center hosted services having varied characteristics. One of the major issues concerning both the cloud service providers and consumers is the provisioning of highest level of Quality of Service (QoS) under unpredictable service demands, while maintaining required revenue targets. Traditional Admission Control (AC) approaches which are usually mathematical or analytical in nature, have limited performance levels in the situations where service types, QoS parameters and user demands become highly unpredictable. To this end, an opportunity exists to utilize the self-learning capabilities of Machine Learning (ML) approaches to incorporate predictive and adaptive Admission Control of service requests without violating the Service Level Agreements (SLA) and simultaneously ensuring targeted revenue to the providers. This paper proposes, implements and evaluates a Bayesian Networks based predictive modeling framework (termed as BNSAC) to provide an autonomic Admission Control of cloud service requests. In summary, the BN-based model learns the historical behavior of the system involving various performance metrics (indicators) and predicts the desired unknown metric (e.g. SLA parameter) for making admission control decisions. It presents simulated experimental results involving various service demand scenarios which provide insights into the feasibility and applicability of the proposed approach for improving the QoS in the cloud computing setup. © 2017 IEEE.

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