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Performance analysis of Bayesian Networks-based distributed Call Admission Control for NGN

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Abstract

The efficient management of networks and the provisioning of services with desired QoS guarantees is a challenge which needs to be addressed through autonomous mechanisms which are intelligent, lightweight and scalable. Recent focus on applying Machine Learning approaches to model the network and service behavioural patterns have proved to be quite effective in fulfilling the objectives of autonomous management. To this end, this paper advances on the idea of implementing a distributed management solution which harnesses the predictive capability of Bayesian Networks (BN). A multi-node distributed Call Admission Control solution (termed as BNDAC) is proposed and implemented to demonstrate the modelling and prediction power of BN. A thorough evaluation of BNDAC is presented in terms of its prediction accuracy, algorithmic complexity and decision-making speed. In an online setup, performance of BNDAC is evaluated and compared with a centralised scenario, to demonstrate its superior performance for Call Blocking Probability and QoS provisioning. Simulation results based on Opnet Modeler and Hugin Researcher show the feasibility and applicability of BNDAC solution for real-time operation and management of real world networks such as the NGN. © 2012 IEEE.

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