

Documents

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Application of bayesian networks for autonomic network management

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Abstract

The ever evolving telecommunication networks in terms of their technology, infrastructure, and supported services have always posed challenges to the network managers to come up with an efficient Network Management System (NMS) for effective network management. The need for automated and efficient management of the current networks, more specifically the Next Generation Network (NGN), is the subject addressed in this research. A detailed description of the management challenges in the context of current networks is presented and then this work enlists the desired features and characteristics of an efficient NMS. It then proposes that there is a need to apply Artificial Intelligence (AI) and Machine Learning (ML) approaches for enhancing and automating the functions of NMS. The first contribution of this work is a comprehensive survey of the AI and ML approaches applied to the domain of NM. The second contribution of this work is that it presents the reasoning and evidence to support the choice of Bayesian Networks (BN) as a viable solution for ML-based NMS. The final contribution of this work is that it proposes and implements three novel NM solutions based on the BN approach, namely BN-based Admission Control (BNAC), BN-based Distributed Admission Control (BNDAC) and BN-based Intelligent Traffic Engineering (BNITE), along with the description of algorithms underpinning the proposed framework. © 2013 Springer Science+Business Media New York.

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