Real and Potential Support of Telecommunication Network Re-dimensioning Task Solutions from Computer Algebra Systems

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Abstract

We consider Virtual Network (VNET) carrying Class 0 traffic (Real – time, jitter sensitive, high interaction (VoIP, Video Teleconference)). The considered VNET is with virtual channels switching, following the main method for traffic Quality of Service (QoS) guaranties – resource reservation. We use an overall telecommunication network traffic modeling approach.

The Network Redimensioning Task includes determination of a necessary number of resources, in a pool considered, guaranteeing the target QoS parameter values. The whole process of NRD solving is considered – from equations derivation from a concrete conceptual reference model, down to numerical results visual analysis.

A conceptual model of teletraffic tasks leads to different analytical models, represented by nonlinear systems of equations. Due to features of some equations, the solving of such systems is a hard task.

The use of functions like *solve* in a computer algebra system is not the key to the right solution of a problem, but some appropriate transformations allow the systems to be solved in a suitable way.

Different aspects in the teletraffic problems are considered having in mind the use of a computer algebra system. These considerations are basis for development of a program package for application in solving teletraffic problems.

A comparison of the classical decision process against a computer algebra support approach is made. Some desirable features are pointed.