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T.N. Borovska, Dr. of Sc., docent, I.S. Kolesnik, PhD, docent, V.A. Severilov, PhD, docent, M.B. Polishuk

MODELS OF EFFICIENCY AND SURVIVABILITY OF COMPUTER SYSTEMS BASED ON THE METHODOLOGY OF OPTIMAL AGGREGATION

Relevance of the problem. Today created and developed large distributed systems for production and services. A feature of these systems is the duality:- material structure, performs some services; - information-computing structure for monitoring and control of the material structure. Examples of such systems: supermarket, banking system, mega-factory, etc. Such systems should be efficient, reliable and durable. Performance criteria and survivability contradictory: system optimization according to one criterion degrades the value of another criterion. Design decisions that improves both criteria at the same time, considered purely heuristic. For practitioners are necessary models for purposefully look for such decisions. The first step in this direction - the development of adequate models of object and effective optimization techniques that: - have no restrictions on the dimension of the system, - have no mathematical limitations on classes of functions, - allow vectorization of calculations.

The choice of the solution to the problem. Methodology of optimal aggregation fulfills these requirements. When using the methods of optimal aggregation of large dimension objects optimization problems are not solved, and are eliminated in the decomposition of multidimensional optimization problem in one-dimensional system. The complexity of moving to stage the problem statement and analysis of resource links between elements of the system. In fig. 1 presents basic object model optimizing efficiency and survivability. For the model chosen interpretation of "opportunistic computer network". Presented 3D graphics - visualization *Msto* matrix. Developed by the operator optimum aggregation for discrete stochastic system objects and services. One of the results of the study - identical formulations of problems of efficiency and survivability.
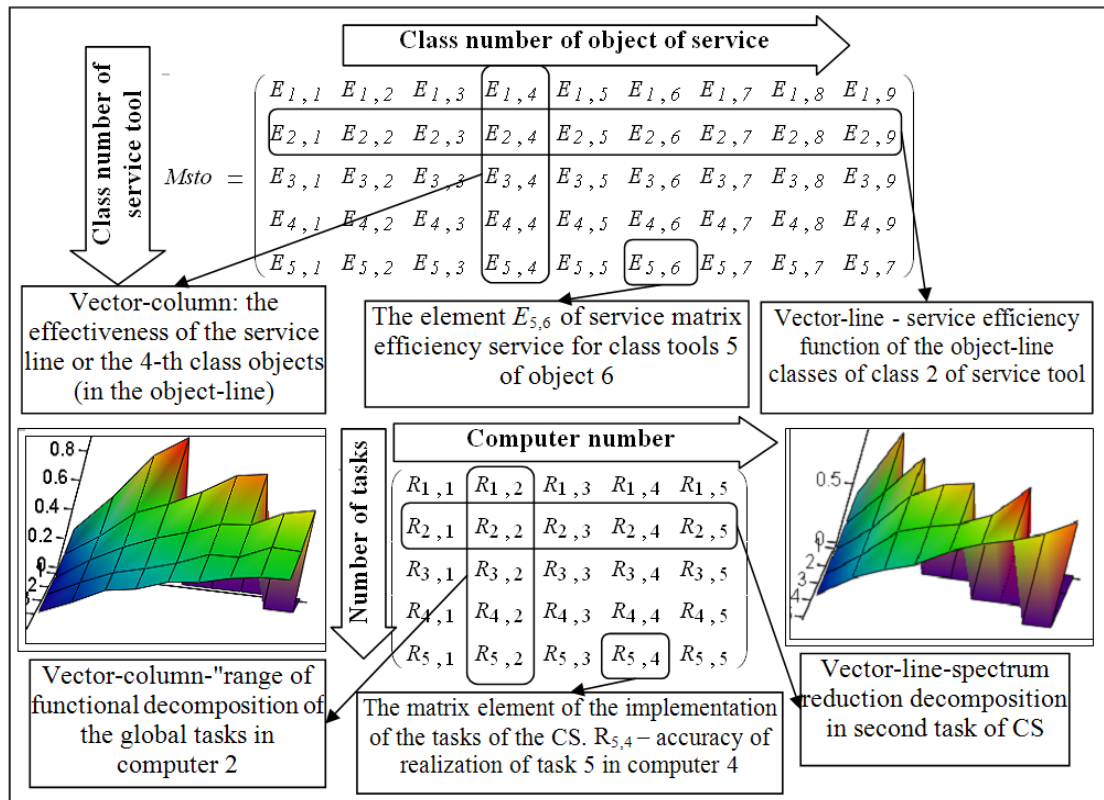

Fig. 1. Structure modeling and optimization tasks. Examples of service functions

The paper posed and solved the problem of optimal distribution of cash flow service between the elements of service facilities. The results of optimization - optimal equivalent functions "costs are, service volume" for the tasks of optimization of efficiency and optimal of function of survivability.