Planning of software modules distribution in processors of computer system

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In this paper we consider questions of planning of software modules distribution to the sites of the computing systems with shared memory. As the basis of planning the time diagrams of early completion of the program modules is taken, this gives the opportunity to pre-allocate the software modules for the nodes of a computer system. This allows to minimize solution time of the set task and the number of processors to be used in order to solve it. When calculating the early completion of the program modules transfer time of the information between the threads is taken into account, made up of the program modules. Using these charts, threads of software modules are created, each of which is executed on the CPU. Generally, between some processors there is an exchange of information demanding some time expenditure which needs to be considered, having corrected as appropriate temporary charts. Generally there is a need of use of a quantity of processors as transferring links (transit computing elements). As an example of creation of the plan of program modules distribution on processors the structure of the computing system from a class of Dn-counts of circulant type (11, 1, 2, 5) is taken. By this example use of transit processors is illustrated. As diameter of the considered computing system it will be shown below, is equal to two, the maximum number of transit processors for the corresponding transfer equally to unit. The processed algorithm is presented in the form of columns schemes in which the cycle on the counter of cycles is presented in an explicit form, as realization of this part of algorithm at plan creation of program modules distribution is the most difficult. The structure of a network of the considered computing system is symmetric, distribution of threads on processors makes no difficulty to be presented. In the beginning threads are distributed on processors randomly, and then construction of interstrand communications is carried out. Here it is important that the number of processors not used in set intervals of time was enough for construction of interstrand communications. Thus, it is possible to minimize, in case of need, number of transit processors and time of a solved task, carrying out various options of placement of threads on computing modules.

Keywords: computing system, planning, program module, processor, computing module, flow graph, following matrix, matrix of distances, early completion of performance of the operator, thread.

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