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Using dynamic deadline in the volunteer computing project SAT@home

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In every volunteer computing project some deadline is used. It is the time limit for execution of a computational tasks on a user computer. If a task wasn't processed in deadline, then project server sends this task to another user's host.

The value of deadline has a great influence to effectiveness of a volunteer computing project. If this value is low, then a lot of hosts will not keep tasks processing in time. If this value is high, then in some cases a solution can be found slower (if this solution corresponds to any task of a host which has been reached the deadline).

We developed the algorithm for calculation the value of deadline which suits well for a particular volunteer computing project. The input data here is percentage of tasks we want to be processed in deadline. According to the algorithm we analyze database of the project –we need to know how many tasks could be processed in different possible variants of a deadline. As a result of this analysis algorithm determine the value of deadline which should be used in the past in ideally case. Based on this value we can predict the value of deadline we should use in the nearest future.

The suggested algorithm was implemented and used in the volunteer computing project SAT@home. We used the threshold percentage value equal to 97 % as an input of algorithm. Deadline was dynamically changed once a day during several months. It turned out, that default deadline (equal to 10 days) is not the better choice –in the case of SAT@home the value of 8 days is better.

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