A Smart Speculative Execution Strategy based on Node Classification for Heterogeneous Hadoop Systems

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Abstract—**MapReduce (MR) has been widely used to process distributed large data sets. MRV2 working on Yarn, as a more advanced programing model, has gained lots of concerns. Meanwhile, speculative execution is known as an approach for dealing with same problems by backing up those tasks running on a low performance machine to a higher one. In this paper, we have modified some pitfalls and taken heterogeneous environment into consideration. Besides, Node classification is used and a novel hierarchy index mechanism is created. We also have implemented it in Hadoop-2.6 and the strategy above is called Speculation-NC while optimized Hadoop is called Hadoop-NC. Experiment results show that our method can correctly backup a task, improve the performance of MRV2 and decrease the execution time and resource consumption compared with traditional strategies.**

Keyword—**MapReduce; Speculative Execution; Time Prediction; Node Classification; Hierarchy Index Mechanism**

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