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Server failure analysis in real time

Chi Shen

Kentucky State University, USA

The motivation of this research project is to reduce server downtime and information loss and therefore lessen the cost incurred under such situations. Computers are very reliable, but failures do occur with possible indications of failure. Current solutions attempt to monitor hardware failure with software installed on the failing computer. Those software solutions can analyze the trend of server downtime by utilizing the thresholds of server system. However, the software may cause CPU overloading. The running of software might consume substantial amount of server time and delay the tasks of the server. Our solution monitors the hardware of the machine with external sensors. The sensors (wireless or wired) collect the data systematically, consistently, and 24 hours per day. The software analyzes the data to predict failure and issue various alerts. The uniqueness of this collection procedure is that the remote monitoring device will operate independently of the monitored machine. The wireless monitoring system architecture consists of a sensor motes and monitoring server. The sensor motes utilize a sensor microprocessor board and communication board. The monitoring server works for data collection, data analysis and attempts to predict failures. We have collected data through several experiments on which we are utilizing data mining techniques to analyze the different datasets and find the relationship of the parameters. Association rule for analyzing and predicting server failure conditions has been used. This technique's approach is to discover the associations by searching massive numbers of possible associations to find co-related associations and identify server's healthy, warning and failure conditions in real time. The research method is intended to identify unrelated data in datasets, and discover the strong rules between data.

Biography

Chi Shen is an Associate Professor, Interim Chair of Division of Computer Science at Kentucky State University. Before she joined KSU, she was an Associate Professor in the Department of Mathematics at the North China Electric Power University. She won the prize of First Rank in a Teaching Methodology Competition final among 110 junior faculty from 58 universities and colleges in China. Her primary research interests are parallel computing, scientific computing, database and data mining, and information retrieval. She is currently supervising undergraduate and graduate students in many collaborative research activities in the fields of High Performance Computing, Data Mining, Bioinformatics and Databases with UK, UofL, and the Kentucky state government. She has numerous publications in international conferences and journals. She is also serving as a Campus Champion for XSEDE (Extreme Science and Engineering Discovery Environment), one of the world largest computing resources.

chi.shen@kysu.edu

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