

Minimization Techniques for Energy Consumption across the Distributed Computing Network

SUMMARY
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Minimization Techniques for Energy Consumption across the Distributed Computing Network

SUMMARY

Today, the issue of energy consumption (EC) in high-performance computing (HPC) or Distributed Computing Systems has a great deal of networking region. There are many algorithms which have been developed for energy consumption computing in different layers of Cloud Computing systems or in distributed computing (i.e. Hardware/Software layer, Service layer, Application layer and System layer). The algorithms are of two types: first, algorithms which directly try to improve the energy by frequency depended operation or scheduling algorithms and second algorithms which focus on improving the performance of the system, with the assumption that efficient running of a system may indirectly save more energy. The connected device generally emits the energy which is of different categories and it is major Challenge to optimize the entire energy of the system. The present work proposes an energy optimization for the electrical components used in the hand-held devices is a broad area of research. Energy principle for information technology contains its own specific energy behaviour. The energy costs in server center are now compatibility to the cost of hardware devices and other comparable devices. In the processor device system, heat existing is a major cause of limiting changes in the performance evaluation. In the laptop, scanners, computers, cell phones, printers, i-pods, and other digital devices, which are portable, reduced the power consumption converts into the battery long life manner. The energy consumption is now presenting challenges as a performance measure in computers, processing the task execution time. The energy is linked with the execution time capacity, where comparable patterns have been recognized by a combination of hardware devices, software devices and algorithms.

In the present work, we have investigated few ideal and effective techniques used for finding the energy consumption. The main goal of the energy consumption is to reduce the consumption of energy through proposed mathematical models. These techniques can be obtained while computing the best results in various techniques such as energy measurement techniques. The contributions of work are summarized below in the proposed chapters:

CHAPTER I INTRODUCTION

This chapter contains a precise introduction about the various aspects related to energy consumption information of research in distributed and parallel computing. The energy consumption of distributed computing network and green computing with the communication protocol in wired network or wireless networks are described. The network system exists of energy efficiency and energy consumption is a major challenging task for any computer network systems. In this chapter, the fundamentals of Unified Modelling Language (UML) are also described in brief.

CHAPTER II REVIEW OF LITERATURE WORK

This chapter describes the review of literature related to energy consumption in distributed systems and energy reduction techniques in distributed computing networks. The literature survey is done by several online libraries and consulting the online journals and white papers. At the end, the challenging problems related to the energy consumption in distributed computing of present work are described.

CHAPTER III A FRAMEWORK FOR DYNAMIC POWER MANAGEMENT

In this chapter, the energy computation methods have been proposed using power management techniques. The method is based on a framework for dynamic power management model. In the current scenario of computing, distributing is gaining popularity as many of users are connected with their handheld device across the

globe. The connected device generally emits the energy which is of different categories and it is major challenge to optimize the entire energy of the system. The present work proposed a frame work for the dynamic power management for completion of tasks in minimum time frame which are routed from one node to another node across the network. For this purpose, a step topological network is selected at the application level of the model. Computed results are depicted for the dynamic power management in the forms of graphs.

The contents of this chapter have been published in the International Journal of computer Applications, Volume 139 (8), pp. 34-39, April 2016.

CHAPTER IV AN ENERGY COMPUTATION IN DISTRIBUTED COMPUTING ENVIRONMENT

In the present scenario, energy optimization for the electrical components used in the hand-held devices is a grey area of research. Energy principle for information technology contains its own specific energy behaviour. The energy costs in server centre are now compatibility to the cost of hardware devices and other compare devices. In the processor device system, heat existing is a major cause of limiting changes in the performance evaluation. In laptop, scanners, computers, cell phones, printers, i-pods, and other digital devices, which are portable, reduced the power consumption converts into the battery long life manner. The energy consumption is now presenting challenges as a performance measure in computers, processing the task execution time. The energy is linked with the execution time capacity, where comparable patterns have been recognised by a combination of hardware devices, software devices, and algorithms. In this chapter, the design of energy-efficient computer systems is proposed by the use of Bellman-ford algorithmic approach. A model is proposed for finding the performance of the system.

The contents of this chapter have been published in the International Journal of computer Applications, Volume 142 (2), pp. 01-06, May 2016.

CHAPTER V ENERGY AND END TO END DELAY COMPUTATION ACROSS STEP NETWORK

Distributed computing is widely used by many researchers due to several advantages in terms of low cost with high efficiency. In the present work, a step topological structure is explained and process model is designed through Markov chain. The energy is computed when information is transmitted from one node to another node. End to End delay is also computed in terms of the transmitted rate. Transmission time is also computed and results are represented in terms of table and graph. Since, it is newly developed topological structure under distributed environment, hence comparison on the said topological structure is not possible however it can be converted in the form of bus topology.

The contents of this chapter have been published in the International Journal of computer Applications, Volume 153 (7), pp. 01-05, Nov. 2016.

CHAPTER VI OPTIMIZATION OF ENERGY CONSUMPTION FOR TASK SCHEDULING ON UNI-PROCESSOR AND MULTIPROCESSOR SYSTEMS

Distributed computer networking plays a very crucial role in the Business, Industries, Education, Research and Development areas. Many users work on the heterogeneous devices which have different configurations. Different devices are connected across the step topological networks and an attempt is made to reduce the overall energy consumption when data is flowing from one device to another device. Optimization of energy consumption reduces the overall cost of transfer of data. Multiprocessor and Uni-processor cases are considered in special cases and computed results are

represented in the form of tables. A well known Hungarian Methodology is used for optimization of the overall energy.

The contents of this chapter have been published in the International Journal of computer Applications, Volume 161 (8), pp. 10-16, March 2017.

CHAPTER VII POWER MANAGEMENT IN THE COMPUTER CENTRE

In the current scenario, many of the computer centres across worldwide are following the approach of distributed systems in which multiprocessors are arranged for timely run of tasks through task scheduling by means of effective networks topology. The centres contain many electrical devices which emit energy. In the present work, a case study of computer centre is considered in which devices are arranged under distributed environment for providing better facilities to the users. Each device is examined properly along with specifications and methods are proposed for optimization of power consumption. Results are represented in the form of tables and graphs.

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CHAPTER VIII CONCLUSIONS AND FUTURE SCOPE

Time to time the energy consumption of distributed computing is a big problem of a few years back and onwards. The energy is a concept of any network is very precious and the Quality of Services (QoS) of any computer networks. In the network's connection, the distributed systems of multi-processors are arranged for the time-dependent run of tasks through task scheduling algorithms of effective networks topology. This chapter concludes the entire research work presented in the chapters along with and future scope of work.