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An energy efficiency of cloud based services using EaaS transcoding of the multimedia data.

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Abstract*: Network-based cloud computing is now rapidly expanding all over as an alternative to conventional office-based computing. Cloud computing has become widespread and the energy consumption of the network and computing resources will grow cloud. This happens when there is increasing attention being paid to the need to manage energy consumption across entire information and communications technology (ICT) sector. In the proposed scheme data duplication technology is going to be used which is method of reducing storage needs by eliminating redundant data. This will save a lot of money on storage cost to store the data and on bandwidth costs to move the data. This paper, presents an analysis of energy consumption in cloud computing. The analysis will consider both public and private clouds. Computing tasks are of low intensity or infrequent. Thus, under some circumstances cloud computing may consume more energy than conventional computing where each user performs all computing on their personal computer (PC).*

Keywords: Cloud Computing, Vdata, Transcoding as a Service, QoS, Data center.

I. INTRODUCTION

The increasing number of availability of high-speed Internet and corporate IP connections is enabling the delivery of new network-based services. Internet-based mail services have been operating for many years so service offerings have recently expanded to include network-based storage and network-based computing. These new services are offered both to corporate and individual users. The cloud computing service model involves the provision to a service provider, of large pools of high performance computing resources and high-capacity storage devices which are shared among end users. There are many cloud service models, generally end users subscribing to the service have their data hosted by the service and also have computing resources allocated. The service provider's may also extend to the software applications required by the end user. To be successful, the cloud service model may also requires a high-speed network to provide connection between end user and service provider's infrastructure. Cloud computing offers an overall financial benefit, in that end users share a large, centrally managed pool of storage and the computing resources, rather than owning and managing their own systems. Often using existing data centers as a basis, cloud service providers invest in the necessary infrastructure and management systems, and in return receive a time-based from end users. Since at any one time, substantial number of the end users are inactive, the benefits of the economies of scale and from statistical multiplexing, and also receives a regular incoming stream from the investment by means of service subscription. The end user sees convenience benefits from data and services available from any location, also from having data backups centrally managed, from the availability of increased capacity when needed and from usage-based charging. Important is the last point for many users in that it averts the need for a large one off investment in hardware, sized to suit maximum demand, and also requires upgrading for every few years. There are various definitions of cloud computing and discussion within the IT industry continues over the possible services that will be offered. We present an overview of energy consumption in cloud computing and compare this to energy consumption in conventional computing. It is the energy consumed when the same task is carried out on a consumer personal computer (PC) that is connected to the Internet but does not use cloud computing method. We consider both public and private clouds that include energy consumption in switching and transmission, data processing and data storage. Specifically, we present a network-based model of user computing equipment, and a model of the processing and storage functions in data centers. We examine a variety of cloud computing service scenarios in terms of energy efficiency. Our approach is to view cloud computing as an analog of a classical supply chain logistics problem, which considers the energy consumption or cost of processing, storing, and transporting physical items. The difference in our case, the items are bits of data. We explore a number of practical examples in which users customers outsource their computing and storage needs to a public cloud or private cloud. Three cloud computing services are considered, including storage as a service, processing as a service and software as a service. As the name implies, storage as a service allows users to store data in the cloud. Processing as a service gives users the ability to outsource selected computationally intensive tasks to the cloud. Software as a service combines these two services and allows users to outsource all their computing to the cloud and use only a very-low-processing-power terminal at home. We showed that energy consumption in transport and switching can be a significant percentage of total energy consumption. Cloud computing can enable more energy-efficient use of computing power. However, we show that under some circumstances cloud computing can consume more energy than conventional computing on a local PC. Our conclusion is that cloud computing can offer significant energy saving techniques such as virtualization and consolidation of servers and advanced cooling systems.

• ANALYSIS OF CLOUD SERVICES

In this section, we compare the per-user energy consumption of each cloud service. The energy consumption of each cloud service is also compared against the energy consumption of conventional computing. The key difference between public cloud computing and private cloud computing is the transport network connecting users to the data center.

A. Storage as a Service

Here we analyze the energy consumption of storage as a service. For example, backup service and file storage is processed and computed after that it is performed on the user's computer. Files are downloaded from the cloud for viewing and editing and again uploaded back to the cloud for storage purpose.

B. Forecasts of Equipment Energy Consumption

Especially in a data center many factors dictate the technology usage in a commercial environment. Prime objectives are to maximize the delivery of services and thus revenue at same time minimize the costs of maintenance and support. In contrast user equipment tends to be retained for longer periods and its evolution in the medium-term future is difficult for prediction. This forecasts focuses on the energy consumption in servers, network and storage.

II. RELATED WORK

A. Malathi.P (July 2015) "A Survey On Reducing Energy Sprawl in Cloud Computing."

Author in this paper have studied various techniques for reducing the energy sprawl in cloud computing. The two amplifying factors are virtualization and task consolidation plays a vital role in optimizing energy consumption. Thus, this survey can be used to enhance the energy consumption models by designing energy prediction models, energy optimization models and energy consumption monitors for the cloud system.

B. Arindam Banerjee, Prateek Agrawal and N. Ch. S. N. Iyengar(2013) "Energy Efficiency Model For Cloud Computing."

Author in this paper have studied the need of power consumption and energy efficiency in cloud computing model. It has been shown that there are few major components of cloud architecture which are responsible for high amount of power dissipation in cloud. Finally we have shown the future research direction and the continuity of this work for next level implementation.

C. Jayant Baliga, Robert W. A. Ayre, Kerry Hinton, and Rodney S.Tucker (January 2011) "Green Cloud Computing:Balancing Energy in Processing, Storage, and Transport."

Author in this paper have studied the comprehensive energy consumption analysis of cloud computing. The analysis considered both public and private clouds and included energy consumption in switching and transmission as well as data processing and data storage. the energy consumption associated with three cloud computing services, namely storage as a service, software as a service, and processing as a service.

D. Anton Beloglazov and Rajkumar Buyya (2010) "Energy Efficient Allocation of Virtual Machines in Cloud Data Centers."

Author in this paper have studied and have proposed and evaluated heuristics for dynamic reallocation of VMs to minimize energy consumption, while providing reliable QoS. The obtained results show that the technique of dynamic reallocation of VMs and switching off the idle servers brings substantial energy savings and is applicable to real-world Cloud data centers. the future work are investigation of setting the utilization thresholds dynamically according to a current set of VMs allocated to a host, leveraging multi-core CPU architectures, and decentralization of the optimization algorithms to improve scalability and fault tolerance.

E. Yogesh Sharma, Bahman Javadi, Weisheng Si (2015) "On the Reliability and Energy Efficiency in Cloud Computing."

Author in this paper have studied to identify the need of a reliability-aware and energy-aware resource provisioning policy to improve the availability of the services of cloud by reducing the energy consumption. Reliability of cloud services still remains a big challenge. With the increase in the infrastructure and design complexity of clouds, they are becoming big consumers of energy and leaving enormous carbon footprints.

B. PROBLEM STATEMENT

• Adopting the framework of Lyapunov optimization, we propose the control algorithm REQUEST to dispatch transcoding jobs. We characterize the energy-delay tradeoff of the REQUEST algorithm numerically and derive the performance bounds theoretically.

• We study the robustness of the REQUEST algorithm. Numerical results show that, given the inaccuracy of estimating the transcoding time, the error of the time average energy consumption and queue backlog is small. Therefore, the REQUEST algorithm is robust to inaccuracy of the transcoding time estimation.

• We compare the performance of the REQUEST algorithm with Round Robin and Random Rate algorithms using simulation and real trace data. The results show that by appropriately choosing the control variable, the REQUEST algorithm outperforms the other two algorithms, with smaller time average energy consumption while achieving queue stability.

C. CONCLUSION

Power consumption in transport represents a significant proportion of total power consumption for cloud storage services at medium and high usage rates. For typical networks used to deliver cloud services today, public cloud storage can consume of the order of three to four times more power than private cloud storage due to the increased energy consumption in transport. The proposed scheme will be designed to provide not only multi-keyword query and accurate result ranking, but also dynamic updates on document collections. By using data duplication method it will reduce the storage space requirement, resulting in saving money and bandwidth. As a result, cloud services are more efficient than modern midrange PCs for simple office tasks. At moderate and high screen refresh rates, power consumption in transport becomes significant and energy savings over midrange PCs are reduced.

D. REFERENCE

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