A Review on Work Flow Scheduling on Cloud Environment

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Abstract- Cloud computing is a distributed design that brings together server resources on an acceptable stage in order to provide on request figuring resources and administrative data. A cloud specialist organization (CSP's) provides the different stages to their customers to use the services and make the web administrative control.

Keywords- cloud, optimization, virtual machine

I.   INTRODUCTION

Cloud Deployment Model

- As depicted in Fig.1.4 subject on necessities the going with four sending models have been perceived, each with particular qualities that reinforce the prerequisites of the organizations and customers of the clouds specifically ways [3].
- Private cloud the cloud foundation is worked in a particular union, and facilitated by the association or an untouchable notwithstanding whether it is found prelude or off reason. The motivation to build a private cloud inside an affiliation has two or three perspectives. Regardless, to strengthen and streamline the utilization of existing in-house assets. The second, security concerns includes information protection and trust in like way make Private Cloud a likelihood for a couple of affiliations. Third, information exchange passed on from near to IT foundation to a Public Cloud is still rather stunning. The fourth, affiliations reliably require full control over mission-basic exercises that stay back of the firewalls.
- Community cloud a few affiliations usually make and have a relative cloud base and in like way diagrams, necessities, qualities, and concerns. The cloud bunch shapes into a level of gainful and free change.
- Public cloud: this is the key sort of current Cloud managing sending model. People considering all things cloud is utilized by the general masses cloud customers and the cloud association supplier has the full duty as to open cloud with its own particular system, respect, and great position, costing, and charging model. Particular comprehended cloud affiliations are open mists including Amazon EC2, S3,and Force.com.

- Hybrid cloud The cloud base is a mix of no under two hazes (private, storing up, or open) that stay striking parts however are bound together by systematized or select development that pulls in information and application transportability (e.g., cloud influencing for weight changing between hazes). Affiliations utilize the cream cloud appear with a specific phenomenal concentration to push their advantages for build up their inside points of confinement by margining out edges business limits onto the cloud while controlling spotlight rehearses on-premises through private cloud.

A.   Cloud Applications

I.   **Development and Testing:** Cloud plays an effective role as it is used for test and development. It saves the cost of setting up environment by setting up physically which includes the manpower and time. The installation and configuration of the software also take more time and this problem is also solved by using clod resources.

II.   **Big Data Analytics:** Cloud is using the concept of big data and provides theeffective data extraction of the business value. It provides the effective data to the retailers and suppliers by extracting the buying patterns of the consumers. The buying patterns of the consumers show their liking and disliking of the consumers to the product.

III.   **File storage:** Cloud offers the facility of data storage, retrieval and access from any web- enabled interface. The user can access data anytime, anywhere with high speed and availability. The large organization stores their data on cloud and only pay for the storage of data and they do not worry about the daily maintenance of the storage system.

IV.   **Disaster Recovery:** Cloud provides the effective data recovery in case of disaster at very effective cost. Data recovery by traditional method is very expensive and slow.

V.   **Backup:** Backing up data is always a complex and time consuming process. The backup includes the tapes and drives to collect the data manually and then dispatching them for backup. Cloud provides the data backup automatically and no need to worry if the data is deleted. By using cloud it is easy to recover the data.

B.   Benefits of Cloud Computing

- Cloud computing have some essential or unique characteristics as shown in Fig.1.2. is to provide qualitative services. These characteristics are as follows [2]

- **On-demand self-service** This self-advantage notification to the organization given by appropriated registering merchants that enables the course of action of cloud assets on ask for at whatever point they are required. In on-ask for self-advantage, the customer finds the opportunity to cloud benefits through an online control board.

- **Broad network access** Cloud computing isolates computing abilities from their consumers, with the goal that they don't need to keep up the capacities themselves. A consequence of this is the computing abilities are found somewhere else, and must be accessed over a network.

- **Resource pooling** Resource pooling is an Information Technology term used as a piece of distributed computing conditions to depict a situation in which suppliers serve diverse clients, clients or "inhabitants" with impermanent and flexible organizations. These organizations can be usual to suit every client's needs with no developments being clear to the client or end client. Occurrences of advantages combine stockpiling, arranging, memory, and framework data trade restrain.

- **Fast elasticity** It is described as the ability to modify resources both all over as required. To the buyer, the cloud has every one of the reserves of being immense, and the purchaser can purchase to such an extent or as pitiful enlisting power as they need.

- **Measured service** Cloud systems therefore control also, redesign asset use by utilizing a metering limit at some level of direction sensible to the sort of affiliation (e.g., dealing with, stockpiling, information transmission, and dynamic customer accounts).

- Stockpiling, information transmission, and dynamic customer accounts).

C.   RELATED REVIEW

Sagnika et al. [1] proposed BAT algorithm for workflow scheduling in cloud computing which helps to handle the large size of data. The scheduling process decides that which task is executed first and which is last according to their requirement of the resources. It manages the resources according to the task size and execution time. The result of the proposed algorithm is compared with particle swarm optimization algorithm and Cat swarm optimization algorithm. The convergence of the proposed algorithm is better than the existing algorithms.

Vinothina et al. [2] proposed Ant Colony Optimization algorithm for workflow scheduling in cloud computing. This model is presented for heterogeneous distributed systems. The

service level agreements are used to check the quality of service of the service providers. The problem of workflow scheduling is solved by using parameters cost, makespan and resource utilization. The ACO algorithms reduce the cost and makespan and enhance the resource utilization.

Liu, Li, et al. [3] proposed the genetic algorithm for workflow scheduling in cloud computing with deadline-constrained. The crossover and mutation probability is adjusted by using convolution approach. This approach prevents from the prematurity and enhances the convergence. The proposed approach is compared with existing algorithms on the simulator at 4 different workflows. The results show that the total execution cost is reduced in this approach.

Garg, et al. [4] formulated the scheduling problem in cloud by using the Genetic Algorithm. The proposed work is done to reduce the computation time and execution cost of the task. This work is done on the cloudSim simulator and it maximizes the resource utilization. The performance evaluation is done on the different parameters and performs well.

Rimal, et al. [5] Cloud supports the Multi-tenancy feature and provides the scalability and other benefits to the other users. Resource management is an important task in the multi-tenant cloud computing which is done by using the scheduling process. In this work cloud based workflow scheduling policy is proposed for efficient computing in cloud. This policy reduces the overall workflow completion time, cost of execution and properly utilize the resources. The result of the proposed work is compared with existing approaches and algorithms. The simulation result of the proposed approach shows more effective results than the existing approaches.

Casas, Israel, et al. [6] proposed a scheduling approach called Balanced and file Reuse-Replication scheduling. This approach is used to schedule the scientific application workflows. It splits the workflows into sub-workflows which help in proper utilization via parallelization process. This approach provides the facility if data reuse and replication which helps in optimization of data and transfer it at run time. The optimization process is based on execution time and monetary cost of workflows.

Kaur, et al. [7] the proposed work is done on the Infrastructure as a service platform of the computer for scheduling and resource provisioning. The scheduling process is done by using the Shuffled Frog Leaping Algorithm (ASFLA). The performance evaluation is done by comparing the result or proposed algorithm with PSO (Particle Swarm optimization). The experiment is performed on different workflows by using Java Simulator and it gives outcome at low cost and completes the task on deadline.

Bölöni, et al. [] proposed the concept of computation scheduling which is used for prediction of computation cost and financial cost. It also predicts the benefit of the output and it is called as value of information. This work is based on the analysis process of real-estate investment opportunities. The

scheduling algorithm used in this work is called as volume based scheduling algorithm.

Ghose, Manojit, et al. [9]have given the energy efficient scheduling approach in cloud environment. In this work six different scheduling strategies are proposed for a collection of scientific workflows. These algorithms consider the static and dynamic energy consumption of the nodes and divided into two parts non-splittable allocation of VMs on single host, and splittable allocation on multiple hosts. The performance of the proposed scheduling approaches is compared with existing policies and it presents the average energy reduction of 70%.

Li, Yibin, et al. [10] introduced the concept of Dynamic Voltage Scaling for maintaining the power and lowering the supply of voltage and frequency of processor. In this work, Energy aware dynamic task scheduling algorithm is used to reduce the energy consumption. This algorithm reduces the more energy consumption as compare to parallelism and critical path scheduling algorithm.

Quang-Hung, et al. [11] proposed an approach for energy saving virtual machine scheduling in cloud computing with fixed interval constraints. This approach reduces the busy time and total energy consumption by the resources. The experiment is performed on the parallel workload battery operated. Introduction of relay nodes act as an intermediate between base station and Cluster Head. Fitness function includes node's left energy, distance among Cluster Heads, sensor node and base station. Energy consumption is reduced and network lifetime is enhanced.

II.   CONCLUSION

This service is similar to a broadband band connection offered by the service provider for the internet connection. Cloud computing provides the services through the internet, these service belongs to hardware and software both. Cloud computing concept is growing high day by day due to its service pay per usage concept. When cloud provides the service in the form of platform it is called as Platform as a service model. When cloud provides the hardware to the consumer it is called as Infrastructure as a service model. When cloud provided the software services it is also called as Software as s service.

III.   REFERENCES

[1]. AmrAmwary, DusanMaga, TarekNahdi, "Modified LEACH Protocol for Heterogeneous Wireless Networks", IEEE New Trends in Signal Processing, pp. 1-4, October 2016.

[2]. Tarunpreet Bhatia, SimmiKansal, ShivaniGoel, A. K. Verma, "A Genetic Algorithm based Distance-Aware Routing Protocol for Wireless Sensor Networks", Computers & Electrical Engineering, Elsevier, Vol. 56, pp. 441-455, November 2016.

[3]. Jin-Shyan Lee, Tsung-Yi Kao, "An Improved Three-Layer Low-Energy Adaptive Clustering Hierarchy for Wireless Sensor Networks", IEEE Internet of Things Journal, Vol. 3, No. 6, pp. 951 – 958, December 2016.

[4]. Ramnik Singh, Anil Kumar Verma, "Energy Efficient Cross Layer based Adaptive Threshold Routing Protocol for WSN", AEU- International Journal of Electronics and Communications, Elsevier, Vol. 72, pp.166-173, February 2017.

[5]. Samayveer Singh, Aruna Malik, Rajeev Kumar, "Energy Efficient Heterogeneous DEEC Protocol for Enhancing Lifetime in WSNs", Engineering Science and Technology, an International Journal, Elsevier, Vol. 20, No. 1, pp. 345-353, February 2017.

[6]. Wenliang Wu, NaixueXiong, Chunxue Wu, "Improved Clustering Algorithm based on Energy Consumption in Wireless Sensor Networks", IET Networks, Vol. 6, No. 3, pp. 47-53, May 2017.

[7]. HemavathiNatarajan, Shobhit Kumar Nagpal , SudhaSelvaraj, "Impact of Rate of Recurrent Communication of Sensor Node on Network Lifetime in a Wireless Sensor Network", IET Science, Measurement & Technology, Vol. 11, No. 4, pp. 473-479, June 2017.

[8]. PeymanNeamatollahi, SaeidAbrishami, Mahmoud Naghibzade, Mohammad HosseinYaghmaee, OssamaYounis, "Hierarchical Clustering-task Scheduling Policy in Cluster-based Wireless Sensor Networks", IEEE Transactions on Industrial Informatics, Vol. 14, No. 4, pp. 1-11, September 2017.

[9]. Khalid A. Darabkh,Wala'a S. Al-Rawashdeh,Raed T. Al-Zubi,Sharhabeel H. Alnabelsi, "C-DTB-CHR: Centralized Density and Threshold-based Cluster Head Replacement Protocols for Wireless Sensor Networks", The Journal of Supercomputing, Springer, Vol. 73, No. 12, pp. 5332-5353, December 2017.

[10].P. Sivakumar, M. Radhika, "Performance Analysis of LEACH-GA over LEACH and LEACH-C in WSN", Procedia Computer Science, Elsevier, Vol. 125, pp. 248-256, December 2017.

[11].AbdulhamidZahedi, Mahdi Arghavani, FariborzParandin, Abbas Arghavani, "Energy Efficient Reservation-Based Cluster Head Selection in WSNs", Wireless Personal Communications, Springer, Vol. 100, No. 3, pp. 1-13, January 2018.

[12].Muhammad Kamran Khan, Muhammad Shiraz, KayhanZrarGhafoor, Suleman Khan, Ali SafaaSadiq, Ghufran Ahmed, "EE-MRP: Energy-Efficient Multistage Routing Protocol for Wireless Sensor Networks", Wireless Communications and Mobile Computing, pp. 1-13, January 2018.

[13].Khalid A. Darabkh, Wala'a S. Al-Rawashdeh, Mohammed Hawa, RamziSaifan, "MT-CHR: A Modified Threshold-based Cluster Head Replacement Protocol for Wireless Sensor Networks", Computers & Electrical Engineering, Elsevier, Vol. 67, pp. 1-13, February 2018.

[14].Chaoming Wang, Yuan Zhang, Xuewen Wang, Zhiyong Zhang, "Hybrid Multihop Partition-Based Clustering Routing Protocol for WSNs", IEEE Sensors Letters, Vol. 2, No. 1, pp.1-4, March 2018.

[15].PratimaSarkar, ChinmoyKar, "TH-LEACH: Threshold Value and Heterogeneous Nodes-Based Energy-Efficient LEACH Protocol", Algorithms and Applications, Springer, Vol. 88, pp. 41-49, April 2018.