A Review on Cloud Computing for Big Data application

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Abstract— *Cloud Computing is an emerging technology used for Big Data applications in several applications, this application is used to solve the resource management problem rising in Big Data application, with Cloud Reservation system(CRS). In Existing System, the execution time is too extended and it is challenging to manage the resource in Big data Application. In this current system, Cloud Reservation System can manage the Clusters with tens of thousands server but the challenge is that it should continue and motivate the search for effective and scalable mechanisms for CRS. In order to solve the problem of existing system resource management, we efficiently determine the appropriate heterogeneous cloud resource expressed as a workflow of service components. We admit the scalability issue associated with traditional, centralized and monitoring information to make resource allocation decision. In this only local information which is used locally is reliable. This proposed system includes two strategies: History based and Just-in-time. These Coalitions perform equally in both low and high system load. This is used to measure the overhead for the implementation of both strategies with respect to communication complexity.*

Keywords— Resource Management, CRS (Cloud Reservation System), Coalition Formation, Scheduling, History Based, Just-in-Time and Big Data Application

I. INTRODUCTION

In recent years, there has been an increasing demand to store and process more and more data, in domains such as finance, science, and government. Systems that support big data, and host them using cloud computing, have been developed and used successfully. (Cloud services and cloud application is widely increasing in today's generation. For example, AWS has added new services, which includes Elastic Cache and DynamoDB. Resource management supports major policies like reservation system, load balancing, energy optimization and quality of service. In existing mechanism implementing these policies are less effective and they are also not scalable. If the resource management is poor it leads to high economic and ecological cost. This Application involves two stages of protocol to provide efficient resource management system. First stage is based upon the duration of execution of their components and is disbanded allowing it to take part in the future coalition. Second stage is based upon the package of these coalition which is designed to perform in a complete workflow.

A. Big Data & Cloud Computing

The concept of big data became a major force of innovation across both academics and corporations. The paradigm is viewed as an effort to understand and get proper insights from big datasets (big data analytics), providing summarized information over huge data loads. As such, this paradigm is regarded by corporations as a tool to understand their clients, to get closer to them, find patterns and predict trends. Furthermore, big data is viewed by scientists as a mean to store and process huge scientific datasets.This concept is a hot topic and is expected to continue The five different aspects used to describe big data (commonly referred to as the five "V"s) are Volume, Variety, Velocity, Value and Veracity.

Volume describes the size of datasets that a big data system deals with. Processing and storing big volumes of data is rather difficult, since it concerns: scalability so that the system can grow; availability, which guarantees access to data and ways to perform operations over it; and bandwidth and performance.

Variety concerns the different types of data from various sources that big data frameworks have to deal with.

Velocity concerns the different rates at which data streams may get in or out the system and provides an abstraction layer so that big data systems can store data independently of the incoming or outgoing rate.

Value concerns the true value of data (i.e., the potential value of the data regarding the information they contain). Huge amounts of data are worthless unless they provide value.

Veracity refers to the trustworthiness of the data, addressing data confidentiality, integrity, and availability. Organizations need to ensure that data as well as the analyses performed on the data are correct.

Cloud computing is another paradigm which promises theoretically unlimited on-demand services to its users. Cloud's ability to virtualize resources allows abstracting hardware, requiring little interaction with cloud service providers and enabling users to access terabytes of storage, high processing power, and high availability in a pay-as-you-go model (González-Martínez et al., 2015). Moreover, it transfers cost and responsibilities from the user to the cloud provider, boosting small enterprises to which getting started in the IT business represents a large endeavour, since the initial IT setup takes a big effort as the company has to consider the total cost of ownership (TCO), including hardware expenses, software licenses, IT personnel and infrastructure maintenance. Cloud computing provides an easy way to get resources on a pay-as-you-go model, offering scalability and availability, meaning that companies can easily negotiate resources with the cloud provider as required. Cloud providers usually offer three different basic services: Infrastructure as a Service (IaaS); Platform as a Service (PaaS); and Software as a Service (SaaS):

- IaaS delivers infrastructure, which means storage, processing power, and virtual machines. The cloud provider satisfies the needs of the client by virtualizing resources according to the service level agreements (SLAs);
- PaaS is built atop of IaaS and allows users to deploy cloud applications created using the programming and

run-time environments supported by the provider. It is at this level that big data DBMS are implemented;

– SaaS is one of the most known cloud models and consists of applications running directly in the cloud provider; these three basic services are closely related: SaaS is developed over PaaS and ultimately PaaS is built atop of IaaS. From the general cloud services other services such as Database as a Service (DBaaS) (Oracle, 2012), BigData as a Service (BDaaS) and Analytics as a Service (AaaS) arose. Since the cloud virtualizes resources in an ondemand fashion, it is the most suitable and compliant framework for big data processing, which through hardware virtualization creates a high processing power environment for big data.

B. Big Data in the Cloud

Storing and processing big volumes of data requires scalability, fault tolerance and availability. Cloud computing delivers all these through hardware virtualization. Thus, big data and cloud computing are two compatible concepts as cloud enables big data to be available, scalable and fault tolerant. Business regards big data as a valuable business opportunity. As such, several new companies such as Cloudera, Hortonworks, Teradata and many others, have started to focus on delivering Big Data as a Service (BDaaS) or DataBase as a Service (DBaaS). Companies such as Google, IBM, Amazon and Microsoft also provide ways for consumers to consume big data on demand. Next, we present two examples, Nokia and RedBus, which discuss the successful use of big data within cloud environments. To grow in popularity in the coming years. Although big data is mostly associated with the storage of huge loads of data it also concerns ways to process and extract knowledge from it . Cloud reservation system includes the coalition formation, which have a short life-span. They exist once the service component they are executing is terminated. Our process allows free resources to choose themselves on spot market. Cloud reservation system is mainly used in market-oriented mechanisms in a large scale computing system. This process is used to solve the run-time demand by providing the tool to begin addressing this system. This system includes the parameters like virtual organization, auction theory and practice, system organization, computer architecture, self-organization and self-management of complex system.

Hence a new system can be proposed to solve this resource management problem in Big Data through Cloud reservation system. It is used to schedule the jobs for each processor and process based on duration of time and accesses the resource by creating package of coalition to work in a complete workflow.

II. RELATED WORKS

A. Existing Cloud Resource Management Systems

Cluster management systems such as Borg [19] and Omega [18] are used by Google in its cloud infrastructure. Google supports containers allowing cloud users to run their applications in a resource-isolated manner Kubernetes, is a system developed at Google for managing containerized applications across a cluster of nodes. Docker uses cgroups to group processes running in the container. Amazon and Google support the creation of Docker-based containers .Twitter's infrastructure is managed by Mesos. A storage management system used by VMware is described in [20].

In this section we presented several existing literatures related on resource management system. Here are some application that includes the resource management process is as follows:

In this paper [1], the clock proxy auction for auctioning related items with limited competition or item complex structure, a core outcome is achieved. The demand reduction incentive present in clock seller revenues are competitive auction, faster than a simultaneous ascending auction. There are bidders on five licenses, typically the demand reduction incentive present in the clock phase

In [2], we analyze theory based optimal VM resource management mainly focus on optimal resource allocation in a single cooperative asynchronous allocation. There is two resource are used, it's cooperative and non-cooperative. However, most of these works in cloud computing area mainly focus on optimal resource allocation using game theory in a single provider scenario. Under the cooperative resource allocation game. Also, this game is cost-effective and scalable as only the collaborators with low-cost participate in a HDCF platform.

In [3], the energy optimizing power aware computational grids, it is used multiple tasks. The quality of NBSEATA was compared it again a set of heterogeneous machines. The problem due to the need system heterogeneity, and it exploit the task level parallelism. The additional design objective because distributed consumption of the system. Resource allocation in grids is already a challenging problem due to the need to address deadline constraints and system heterogeneity. It becomes more challenging when energy management is an additional design objective because energy consumption of the system.

In this paper [4], the optimal solution provisioning algorithm (OCRP) to provision the integer programming with multiple stochastic sub problems. The approach is divide into an OCRP problems, can optimally adjust the simulations. The performance evaluation of the OCRP algorithm has been performed by numerical studies and simulations. Also applied Benders decomposition approach to divide an OCRP problem into sub problems which can be solved in parallel.

In [5], the performance evaluation are quantified the profit federation by individual Cps and demonstrated smoothing effects on spot. A simple dynamic programming problem is used to sharing in the repeated uncertainty problem in future strategy. Performance evaluation results quantified the profit gained by the federation as well as by individual CPs and demonstrated significant smoothing effects on the spot market price.

In [6], A stochastic model to evaluate the metrics as availability, the performance of an IaaS cloud. Also investigate the effect of different strategies between the provider and user. The cloud computing is required to quantify the offered Quality of service to manage the SLAs. Several performance metrics have been defined, such as availability, utilization, and responsiveness.

In [7], it is presented as the problem of economical and online video transcoding in COVT cloud environment. The transcoding time is targeted chunk size and the system

delay on different hardware using different modes. Both test bed and simulation experiments to evaluate our method on real-world workloads and large-scale simulated workloads.

In [8], this paper presented the kraken system which allows to dynamic scale up and down the computed resources for cloud application to generalize the algorithm beyond fat tree networks. The cloud application runtime resources is effectiveness of these system is reduced. The bandwidth and compute resources allocated to a cloud application at runtime.

In [9], there are several directions for future work, it is improved by in-cooperating features into the prediction model. The cloud utility optimization is one of the future work, also it is a kind of middle term prediction. It is acceptable for the cloud resources provider and consumer under provisioning of resources. The service quality can be further improved by incorporating more features into the prediction model. Such a target can be fulfilled by leveraging the customer profile information. The current solution for capacity planning is a kind of mid-term prediction

In [10], this paper the basis of tracking the cloud computing design and optimization of energy consumption. A long term of the computing the requirements of practical engineering application and carry out the intensive study on core problems involved. According to their inspection, the electric bills are prepared and most often these are prepared on the basis of assumption which could be inaccurate, costly, time-consuming as well as error prone

In [11], the most usable form of energy is used for electricity with the evolution of modern technology. It is escalating the production of electricity is confined the deficiency of resources. Due to the absence of regular monitoring system, to avoid traditional relate the methodologies stored in database.

In [12], this paper presents the simple, efficient, and inexpensive design of an automatic single phase energy meter reading system based on GSM wireless network which also has the provision for user notification. To transmit the data to utility for regular basis impacts of the system usage.

In [13], this paper presents a smart energy meter for an automatic metering and billing system. In this meter energy utilized and the corresponding amount will be displayed on the LCD continuously and communicated to the controlling base station.

In [14], it calculates power consumption and electric energy demand. Measurements are done through a microcontroller-based circuit. The web server is a modification of a software originally used to monitor mesh network radio links. Measures are visualized as power versus time or energy versus time.

In [15], the Electrical supply companies are trying to adopt the electronic measurement of energy consumption data because of reduced manufacturing cost, improved measurement accuracy. The developed energy meter calculates the total average active power mainly for residential consumers. The hardware circuit accepts single phase voltage.

In [16], an overview of the Smart Grid's Advanced Metering Infrastructure (AMI) and Demand Response (DR) functionalities, and the communication requirement they pose for the new SEP protocol. An evaluation of the theoretical performance bounds of the new architecture based on the analytical model.

In [17], A predictive resource auto-scaling system that dynamically books the minimum bandwidth resources from multiple data centers for the provider to match its short-term demand projections. The optimal load direction from channels to data centers is derived with provable performance. We further provide suboptimal solutions that balance bandwidth and storage costs.

The main outline of this survey is to analyzed the applications that are compared based upon the parameters such as Coalition, Reservation system, Resource management, infrastructure, workflow of components and processor. Majority of the applications uses Coalition formation and infrastructure. Almost much application is used to manage the processors based upon the server.

III. CONCLUSIONS

In this paper we focused to resolve the resource management problem in big data application using cloud reservation system. Therefore it can be used for reservation of various aspects, with respect to the cloud application. In this reservation system all servers in rack are indistinguishable from one another. In the Future generation the system can create its own structure that the reservation system needs to manage the resource.

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