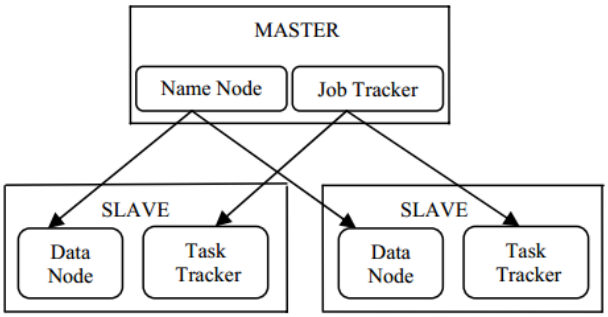

Figure 1: Master/Slaves Structure of Hadoop Cluster

6) **Dynamic Resource Allocation Strategy in Cloud Computing Environment**
Cloud data centers can be a distributed web in construction that is composed of countless compute nodes, storage nodes, and web node. Every single node is industrialized by a sequence of resources such as CPU, recollection, web bandwidth and countless more. These resources are shouted multidimensional resources. The number of adjacent mechanisms (VMs) used in a huge cloud data center every single date can be extremely colossal, and their placement familiarize a momentous burden on the data center web.
7) **Dynamic Resource Allocation using Migration in Cloud**
The cloud computing period guarantees subscribes that it sticks to the ability level accord by bestowing resources as ability and by needs. Though, date by date subscribers' needs are rising for computing resources and their needs have vibrant heterogeneity and period irrelevance. But in cloud computing nature, resources are public and if they are not properly distributed next it will consequence into resource wastage.

4. Related Work

Murugesan, S. et al, in "Green Cloud Computing and Environmental Sustainability" 2012 [10], the authors describe Cloud computing is a highly scalable and cost-effective infrastructure for running HPC, enterprise and Web applications. However, the growing demand of Cloud infrastructure has drastically increased the energy consumption of data centers, which has become a critical issue. High energy consumption not only translates to high operational cost, which reduces the profit margin of Cloud providers, but also leads to high carbon emissions which is not environmentally friendly. Hence, energy-efficient solutions are required to minimize the impact of Cloud computing on the environment. In order to design such solutions, deep analysis of Cloud is required with respect to their power efficiency. Thus, in this chapter, they discuss various elements of Clouds which contribute to the total energy consumption and how it is addressed in the literature. They also discuss the implication of these solutions for future research directions to enable green Cloud computing. The chapter also explains the role of Cloud users in achieving this goal.

Islam, S.S. et al, in "Cloud computing for future generation of computing technology" 2012 [11], the authors describe The emergence of cloud computing, envisioned as the future generation of computing model for its major advantages in on-demand self-service, ubiquitous network access, location independent resource pooling and transference of risk, has established a trend towards building massive, energy-hungry and geographically distributed data centers. It is the latest developments of computing models after distributed computing, parallel processing and grid computing. It achieves multi-level virtualization and abstraction through effective integration of variety of computing, storage, data, applications and other resources, users can be easy to use powerful computing and storage capacity of cloud computing only need to connect to the network. It can also concentrate all computation resources and manage automatically through the software without intervene. In this paper, they highlight the different aspects of cloud computing for finding the actuality of the future generation of commuting in the form of cloud computing after mainframe based computing, personal computing, client server based computing and web server based computing.

Owusu, F. et al, in "The Current State of Understanding of the Energy Efficiency of Cloud Computing" 2012 [12], the authors describe Cloud computing has been hailed as the achievement of the long-held dream of computing as a utility and has the potential to transform a large part of the Information and Communication Technology (ICT) industry. Cloud computing is both a business and an economic model which has been gaining popularity since 2006 and it is currently the most talked about technology in the ICT industry. Because it views hardware and software as commodities, the cloud is an example of a disruptive technology. It offers enterprises the opportunity to reduce hardware and software cost and the potential reduction of maintenance and support staff. Data centers and cloud computing services providers hope that the widespread adoption of the cloud will bring them more profit and they are actively promoting the technology. The cloud has had its share of controversy; ranging from the definition of cloud computing to its energy efficiency. This paper discusses one area of controversy; the energy efficiency of cloud computing. They outline previous contributions to the discussion of energy efficiency of cloud computing, provide a working definition of cloud computing and discuss its importance, which will grow as the technology matures and becomes well known.

Lawey, A.Q. et al, in "Distributed Energy Efficient Clouds Over Core Networks" 2014 [13], the authors describe In this paper, they introduce a framework for designing energy efficient cloud computing services over non-bypass IP/WDM core networks. They investigate network related factors including the centralization versus distribution of clouds and the impact of demand, content popularity and access frequency on the clouds placement, and cloud capability factors including the number of servers, switches and routers and amount of storage required in each cloud. They study the optimization of three cloud services: cloud content delivery, storage as a service (StaaS), and virtual machines (VMS) placement for processing applications. First, they develop a mixed integer linear programming (MILP) model to optimize cloud content

delivery services. Our results indicate that replicating content into multiple clouds based on content popularity yields 43% total saving in power consumption compared to power un-aware centralized content delivery. Based on the model insights, they develop an energy efficient cloud content delivery heuristic, DEER-CD, with comparable power efficiency to the MILP results. Second, they extend the content delivery model to optimize StaaS applications. The results show that migrating content according to its access frequency yields up to 48% network power savings compared to serving content from a single central location. Third, they optimize the placement of VMs to minimize the total power consumption. Our results show that slicing the VMs into smaller VMs and placing them in proximity to their users saves 25% of the total power compared to a single virtualized cloud scenario. They also develop a heuristic for real time VM placement (DEER-VM) that achieves comparable power savings.

Priya, B. et al, in "A survey on energy and power consumption models for Greener Cloud" 2013 [14], the authors describe The growing demand of computation, large data storage needed for running a high performance computing enterprise and high dimensional data based web application increases the energy and power consumed by large infrastructure. Cloud computing is providing a solution as part of the Green IT initiative to reduce the adverse environmental impacts and save energy. Our paper describes important metrics of cloud computing which makes it greener. They discuss the various power and energy models and identify major challenges to build a model for Green Cloud. They also discuss the ways to reduce power and energy in terms of cloud computing services. Our work surveys the various models and helps understand the road map for a greener cloud.

Oriaku, C. et al, in "Holistic View Angles of Cloud Computing Services Provisions" 2012 [15], the authors describe Cloud computing services (CCS) is a modern blend of provisioning technologies and management of resources formed on limited requirements such as accessibility, hypotheses of elasticity and massive deployment. This paradigm offers on-demand IT resources such as applications, networks, services, data, servers and storage that are readily accessible through the Internet. Need for globalisation and collaboration is currently driving the adoption/rollout of cloud technology. Therefore, the current provision of CCS is focused and segmented, addressing explicit concerns according to these needs. This presents challenges for integrated services such as the missing interfaces concerning the diverse attributes of CCS, the required techniques and dependencies for efficient rollout/adoption. This paper proposes 6-view angles necessary for offering CCS, including all their important criteria and categories. These proposed views should help CCS architects and software developers achieve diverse optimised services, enhance these services in relation to communication, power usage, and interfaces that will ease cost and time, make these services desirable and accessible.

Hulkury, M.N. et al, in "Integrated Green Cloud Computing Architecture" 2012 [16], the authors describe Arbitrary usage of cloud computing, either private or public, can lead to uneconomical energy consumption in data processing, storage and communication. Hence, green cloud computing solutions aim not only to save energy but also reduce operational costs and carbon footprints on the environment. In this paper, an Integrated Green Cloud Architecture (IGCA) is proposed that comprises of a client-oriented Green Cloud Middleware to assist managers in better overseeing and configuring their overall access to cloud services in the greenest or most energy-efficient way. Decision making, whether to use local machine processing, private or public clouds, is smartly handled by the middleware using predefined system specifications such as service level agreement (SLA), Quality of service (QoS), equipment specifications and job description provided by IT department. Analytical model is used to show the feasibility to achieve efficient energy consumption while choosing between local, private and public Cloud service provider (CSP).

Wei Zhao et al, in "Modeling and simulation of cloud computing: A review" 2012 [17], the authors describe Cloud computing provides computing resources as a service over a network. As rapid application of this emerging technology in real world, it becomes more and more important how to evaluate the performance and security problems that cloud computing confronts. Currently, modeling and simulation technology has become a useful and powerful tool in cloud computing research community to deal with these issues. In this paper, to the best of their knowledge, they review the existing results on modeling and simulation of cloud computing. They start from reviewing the basic concepts of cloud computing and its security issues, and subsequently review the existing cloud computing simulators. Furthermore, they indicate that there exist two types of cloud computing simulators, that is, simulators just based on software and simulators based on both software and hardware. Finally, they analyze and compare features of the existing cloud computing simulators.

Narayan, A. et al, in "Power-Aware Cloud Metering" 2014 [18], the authors describe The cost of electricity contributes significantly to the operating expense incurred in hosting cloud services. It is necessary to consider this cost while charging the consumers for their service utilization. In this work, they arrive at a metering mechanism for cloud services, in which the price of a cloud service tracks the variable input cost of electricity from a smart grid. The power-aware cloud metering developed here is a dynamic pricing and billing model where tariff for a cloud service is varied in accordance with the input electricity cost. They arrive at a model for power consumption of virtual machines hosted on the cloud infrastructure. This power consumption model is used in calculating the cost of operation of the service. A cloud instance leased by a consumer is billed based on the cost of operation obtained, and its resource utilization. Experimental results validate the approach presented.

Itani, W. et al, in "Accountable energy monitoring for green service routing in the cloud" 2013 [19], the authors describe In this paper, they present the design and

implementation of G-Route (Green Route), an autonomic service routing protocol for constructing energy-efficient service provider paths in collaborative cloud computing architectures. The chief contribution of this work resides in autonomously selecting the optimal set of composite service components sustaining the most efficient energy consumption characteristics among a set of providers for executing a particular consumer service request. The routing protocol processes accountable service energy measurements extracted securely from within the provider sites or data centers using trusted computing technologies and cryptographic mechanisms. By pushing green computing constraints into the service routing protocol decision engine, they can leverage the collaborative cloud computing service model to maximize the energy savings achieved by focusing on a path of providers that executes the service requests instead of directing the green computing efforts towards a single provider site. The major goal of G-Route is to enhance the energy savings in the overall cloud computing infrastructure. The protocol design is deployed in a real cloud computing environment using the Amazon EC2 cloud platform. The analyses of the protocol convergence characteristics, traffic overhead, and resilience demonstrate the capability of the proposed system to significantly reduce the overall energy requirements of collaborative cloud services.

Tahamtan, A. et al, in "A Cloud Repository and Discovery Framework Based on a Unified Business and Cloud Service Ontology" 2012 [20], the authors describe Cloud computing introduces a fundamental shift in service delivery. A market registry, flexibility, exchangeability and integration of services are important issues for its success. In this work they introduce a unified Cloud and business service ontology with querying capabilities. Our framework addresses two aspects: on the one hand it gives answer to leading question how they can structure the term Cloud computing (as a question of basic research) and how they can enable a matching between offered Cloud services and demand. It closes the gap how they can summarize and describe Cloud services in a standardized way. On the other hand, it particularly addresses the demand for flexibility and exchangeability by the Cloud Computing paradigm and can serves as a repository of services.

Murugesan, S. et al, in "Green IT: An Overview" 2012 [21], the authors describe Enterprises, governments, and societies at large have a new important agenda: tackling environmental issues and adopting environmentally-sound practices. While many people consider IT is part of the problem to environmental pollution, it can be saviour too. IT is both a solution and a problem for environmental sustainability. They can exploit the power of IT in innovative ways to address mounting environmental issues and make their IT systems Â-Â and their use Â-Â greener. Green IT refers to environmentally sound information technologies and systems, applications, and practices. This chapter examines environmental impacts of IT and explains what Green IT is. It presents a holistic approach to greening IT and highlights how IT could help businesses in their environmental initiatives and reduce their carbon emissions

Polito, S.G. et al, in "Cloud-enabled NGN architecture with discovery of end-to-end QoS resources" 2013 [22], the authors describe Cloud computing offers remote resources on top of which users can deploy their own services, as well as ready to use services. Computing resources located in different sites and belonging to multiple providers can be used for a service. One requirement for the user to get access to cloud services is being connected with the remote computing resources. Similarly, interworking between computing resources located in different sites requires network resources connecting them. Therefore, cloud services can be thought as composed of computing and network resources. Quality of service (QoS) constraints can be posed on both of them. This is motivating a request for cloud architectures able to discover remote computing and QoS network resources. Design of such architecture is still an open issue. In this paper, they provide a proposal for it. They leverage on the existing Next Generation Network architecture, which was designed for IP services, and propose extensions to address the cloud provisioning requirements. The proposed extensions are about control and transport layer functions for automatic discovery of computing and QoS networking resources, respectively. Simulation results show the scalability of the discovery model in networks with increasing size and number of cloud providers.

Dong Yuan et al, in "An Algorithm for Cost-Effectively Storing Scientific Datasets with Multiple Service Providers in the Cloud" 2013 [23], the authors describe The proliferation of cloud computing allows scientists to deploy computation and data intensive applications without infrastructure investment, where large generated datasets can be flexibly stored with multiple cloud service providers. Due to the pay-as-you-go model, the total application cost largely depends on the usage of computation, storage and bandwidth resources, and cutting the cost of cloud-based data storage becomes a big concern for deploying scientific applications in the cloud. In this paper, they propose a novel algorithm that can automatically decide whether a generated dataset should be 1) stored in the current cloud, 2) deleted and re-generated whenever reused or 3) transferred to cheaper cloud service for storage. The algorithm finds the trade-off among computation, storage and bandwidth costs in the cloud, which are three key factors for the cost of storing generated application datasets with multiple cloud service providers. Simulations conducted with popular cloud service providers' pricing models show that the proposed algorithm is highly cost-effective to be utilised in the cloud.

5. Conclusion and Future Works

This paper surveys resource allocation strategies to improve energy consumption by cloud data centers supporting green cloud computing. In any Cloud computing Environment if we want to improve the Energy Efficiency of the datacenters we must look into improving the resource allocations made to the datacenters by the users as it is one of the most efficient ways to reduce energy consumption. In particular, energy-efficient computing and architectural principles for energy-efficient management of Clouds supporting green computing is still new. A Green Energy-efficient resource allocation policy and scheduling algorithms considering, a number of

open research challenges, addressing which can bring substantial benefits to both resource providers and consumers. Future work will focus on implementing a Energy efficient green resource allocation policy. We will present the design and implementation of an automated resource management system that achieves a good balance between the two goals, overload avoidance and reduction of Physical Machines used and hence Green Computing.

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