Cloud Computing Implication & Exploration to Green Cloud: An Overview

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Abstract— Cloud computing is a journey of applications needed to be established on an individual's computer towards the applications functioning online. Cloud computing resources are brought by server-based applications through public Internet. The applications are accessible for the cloud users via mobile and desktop devices. Due to the development of numbers of services introduced by a cloud computing provider, the requirement of higher traffic and measuring loads that is noticeable must be estimated and well-disposed. The distinction between a cloud and a data center is that a cloud is a form of computing that stores data on the internet, while a data center stores data within an organization's local network. Cloud providers are showing more interest in reducing the cost of electricity consumption. High energy consumption leads to high carbon emissions which is not eco-friendly. Data centers in the cloud must be made as green data centers to achieve the above. The fundamental idea behind energy efficiency is to save power, reduce the emission of harmful gas namely carbon-dioxide and also to manage e-waste by making use of maximum resource utilization and less use of the hardware. This paper discuss the significance of cloud computing, various technologies used, various functionalities used in cloud, the way how data is stored in the cloud and the way on how to manage the cloud. Additionally, this paper discuss about how to manage e-waste, the requirement and growth of green cloud. Finally, this paper also discuss about the importance of green cloud, various approaches to maximize energy efficiency and resource efficiency.

Keywords: Cloud Computing, Virtualization, Green Technology, Data Center, Energy Efficiency, Resource Utilization, Cloud Computing Provider.

I. INTRODUCTION

The nomenclatures “cloud computing” and “working in the cloud” is concerned with the accomplishment of computer tasks using services dispatched solely over the Internet. Examples of Cloud Computing Services incorporate Web-based email services in such a way that users can access their email from any computer with the help of a browser and an Internet access within the cloud which is mandatory, irrespective of the underlying hardware on a particular computer. Cloud Computing provides us an aid by which we can access the applications as utilities, over the Internet. It also allows us to create, design and adapt applications online. On the other hand, we can say that Cloud is an entity, which is present at a remote location. Cloud Computing is the mixture of a technology, objectives that accommodate storage services on the Internet. This incorporates features promoting high adaptability, which makes available improved extensibility distinguishing the previous existing computing techniques. It can effectively utilize, allocate or reallocate resources dynamically which can be capable to monitor their performance progressively. This method can help the device as well as the user to be located individually. The main difference in cloud computing and traditional networking is virtualization that permits the cloud users by endowing virtually vast number of resources. The user needs to spend more money for installation and maintenance of hardware even though a small amount of resource is only needed in a traditional network setup, but in a cloud infrastructure, cloud users can make use of multiple servers using the virtualization technique by providing resource sharing and the user may need to pay for the services used. The cloud user needs a browser and the work can be done easily through internet connection. This helps the user to save resources.

A. History of Cloud Computing:

The perception of Cloud Computing came into reality in 1950 with implementation of mainframe computers, accessible via thin/static clients. In view of this fact, cloud computing has been derived from static clients to dynamic ones viz. software to services. In case of mainframe computers, these were accessed by multiple users through dumb terminals. Employees in an organization or elsewhere cannot afford to maintain these mainframe computers which cost a premium. So the solution was to share a single resource among the users to reduce maintenance and cost. In the 70’s, the concept of virtual machines was introduced. Following this a virtualization software namely VMware was introduced to execute one or more operating systems simultaneously in a remote environment. In the 1990s, virtual private network connections were being offered by telecommunications companies.

B. Deployment Model of Cloud:

This depends on the cloud user. The cloud has been designed in such a way to provide cloud services according to the individuals’