International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Challenges in Cloud Computing: Enabling the Future Internet of Services

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Abstract: ***Because of enhancement in mobile phone technology, mobile phones are turning into an inescapable part of human lives. In setting of running enormous applications on mobile phones, users cannot utilize the capability of mobile phones in an effective way since mobile phones are compelled by processing power, memory requirements and battery limit. Running complex software on smart mobile phones could bring about poor performance and reduced battery life due to their limited resources. To mitigate this resource scarcity issue of the mobile phones, mobile cloud computing is the most guaranteeing solution which consolidates the technologies from both the mobile computing and the cloud computing. The execution of large application on mobile phones is augmented by effective and resource-abundant cloud servers. This is accomplished by dividing an application into tasks such that the computational intensive tasks are offloaded to cloud and in the wake of executing task on cloud, results are sent once again to mobile phone, alluded to as computation offloading. An advanced a versatile, framework can be implemented for powerfully and ideally divide the application. E-Learning application can be developed based on android operating system using this methodology of dividing application into task and running on them on cloud server.***

Keywords: Cloud computing, Android Operating System, Poor performance, Reduced battery life.

1. Introduction

As predicted by International Data Corporation Market Research Company, nearly 1.1 billion mobile phones were sold in 2014, and its number is expected to increase over 1.5 billion in 2017 [1]. In order to fulfill the needs of huge number of users, smart mobile phones feature flexible portable applications. The majority of these mobile applications are user intuitive and data-processing concentrated, both of which oblige fast response and long battery life. Notwithstanding, most business off-the-rack smart mobile phones, compared with computers, are usually furnished with low-speed processors and limited capacity batteries. Running modern software on smart mobile phones can bring about poor execution and reduced battery life. Accordingly, it turns into a critical issue in planning smart mobile phones to convey satisfactory performance and extended battery life. A considerable measure of enhanced hardware, for example, dynamic voltage scaling, leakage power control and instruction level parallelism have been proposed to enhance processor speed and decrease energy utilization. Albeit enhanced technology can convey better performance, embracing high-end processors is not generally suitable for budget constrained tasks. As of late, cloud computing has gotten to be an alternate conceivable solution for improving the processing capacity of smart mobile phones. The cloud computing sellers give computing cycles to the enlisted provide to decrease computation and energy utilization of smart mobile phones, for example, Amazon Elastic Compute Cloud (EC2), Amazon Virtual Private Cloud (VPC), and PacHosting. Nonetheless, it takes both time and energy to transfer information to the cloud and recover the results from the cloud. The computation capability of the cloud can likewise influence the execution time.

2. Cloud Computing

In modern years, Cloud Computing has been analyzed by the government, Japan strategy, the clique of the Ministry of Internal affairs and Communications. Notwithstanding this, diverse well-known companies are utilizing cloud services, such as Windows Azure, Google Apps, and Amazon. People over the world thought of various definition of cloud computing. Different companies have different point of view, for instance companies like IBM considers that cloud computing is a forefront of IT assets though then again Google confirm that cloud computing is service based, foremost, spacious information vault application. Thus, over all the meanings of distributed computing, the significant working rule is that it is a parallel and distributed processing model, which passes on IT as a Service. The center structure of Cloud computing contains a few computer servers which are named as "clouds". All the resources are gathered together with a specific end goal to structure a centric data storage and data processing center. As different assets are collected different configuration tools are obliged to stanchion the "cloud" side of software administration. As the customer recognizes the data request to the server, the request is generally processed and results list items return. Be that as it may, it is critical to complete the measurement and monitoring, to achieve the nature of service and thriving of effective resource allocation and productivity of resource.

3. Android Operating System

Android is a software stack for mobile devices that incorporates an operating system, middleware and key applications. The Android SDK gives the tools and APIs important to start creating applications on the Android platform utilizing the Java programming language. Application framework characterized the normal structure of projects in the particular domain. Basically, a framework is a part that can be reused; it set the architecture of applications and included as a set of theoretical classes and the

collaboration of their examples. Android is an open source operating system based on Linux portion and developed by Google. Dissimilar to PC operating system, mobile devices operating systems are compelled by their hardware, storage space, power dispersal and mobility conditions. Contrasted and the improvement of applications on PC, there are some distinctive gimmicks of applications on mobile device operating systems [2] [3].

4. Literature Survey

The methodology of Byung-Gon Chun, Petros Maniatis [4] is the first to repeat the entire smart mobile phone image and to run the application code with few or no changes in influential VM replicas to change a solitary machine computation to a distributed processing semi-automatically. They accept that the CloneCloud framework empowers new, energizing modes of augmented execution for applications in diverse situations, and offers fascinating opportunities for research and for practical arrangements that wed the accommodation of hand-held devices with the power of cloud computing.

In this study by Adam Dou et al [5], they introduced Misco, a MapReduce system for supporting applications on mobile devices. This is the first framework that we know of, that proposes a MapReduce system for mobile situations. They have additionally showed the practicability of their framework by sending applications on their N95 test bed. Misco is the first MapReduce structure implementation for mobile context that they know of, and there are numerous research directions to continue in. They anticipate expanding their framework to consider data locality, decentralization and device heterogeneity. Further, the new mobile context acquaints the opportunity to investigate totally distinctive sorts of applications, applications where the worker nodes process information gave to them, as well as dynamic participants in the creation of data.

Eduardo Cuervo et al [6] presented MAUI, a framework that empowers fine-grained energy-aware offload of mobile code to the infrastructure. Past methodologies to these issues either depended vigorously on software programmer support to partition an application, or they were coarse-grained obliging full process relocation. MAUI utilizes the profits of a managed code environment to offer the best of both worlds: it supports fine-grained code offload to expand energy savings with negligible load on the software programmer. MAUI chooses at runtime which techniques ought to be remotely executed, determined by an optimization engine that attains to the best vitality funds conceivable under the mobile phone's present connectivity constrains. In their assessment, they demonstrate that MAUI empowers: 1) a resource-intensive face recognition application that uses an order of magnitude less energy, 2) a latency-sensitive arcade game application that duplicates its refresh rate, and 3) a voice-based language translation application that sidesteps the confinements of the smartphone environment by executing unsupported segments remotely.

Byung-Gon Chun et al [7] presents the design and implementation of CloneCloud, a framework that automatically transforms mobile applications to profit from the cloud. The framework is an adaptable application partitioner and execution runtime that empowers unmodified mobile applications running in an application-level virtual machine to consistently off-load piece of their execution from mobile phones onto device clones working in a computational cloud. CloneCloud utilizes a mix of static examination and dynamic profiling to partition applications automatically at a fine granularity while streamlining execution time and energy use for a target calculation and communication environment. At runtime, the application dividing is effected by relocating a thread from the mobile phone at a picked point to the clone in the cloud, executing there for the rest of the segment, and re-coordinating the relocated thread once again to the cell phone.

Pelin Angin and Bharat Bhargava [8] introduced a dynamic performance optimization system for portable mobile-cloud utilizing mobile agent based application partitions, forcing insignificant structural necessities on the cloud. Analyses performed with two certifiable applications show that the proposed system is guaranteeing for enhanced execution and wide appropriation in portable distributed computing.

In this study by Lei Yang et al [9] studied the application partitioning issue for mobile information stream applications. They have designed an application system to give runtime support to the versatile partitioning and distributed execution of such enhanced mobile cloud applications. The structure has the capacity to serve extensive number of mobile clients by leveraging the flexible resources in existing cloud infrastructures. Under this system, they additionally have designed a genetic calculation to tackle the part issue. The reproduction results demonstrate that our system can give more than 2X enhancement in the application performance over the strategies without partitioning.

Sokol Kosta et al [10] introduce ThinkAir, a structure for offloading mobile computation to the cloud. Utilizing ThinkAir requires just basic adjustments to an application's source code coupled with utilization of their ThinkAir tool chain. Experiments and assessments with micro benchmarks and processing intensive applications exhibit the profits of ThinkAir for profiling and code offloading, and also obliging changing computational prerequisites with the capacity of on-interest VM resource scaling and making full use of parallelism. They are proceeding with the improvement of a few key parts of ThinkAir: they have ported Android to Xen permitting it to be run on business cloud base, and they keep on chipping away at enhancing developer help for parallelizable applications.

5. Proposed System

Here, an application processing framework is proposed to partition the massive application applied in mobile cloud computing paradigm. To reduce the resource shortage issue of the mobile phones, mobile cloud computing is used which consolidates the technologies from both the mobile computing and the cloud computing. The execution of extensive application on mobile phones is augmented by powerful and resource-abundant cloud servers. This is

attained to by partitioning an application into assignments such that the computational intensive tasks are offloaded to cloud and after executing task on cloud, results are sent over to mobile phone. Some part of task execution is done at mobile phones and then these results are combined to produce final output.

6. Conclusion

In setting of running massive applications on mobile phones, users cannot use the capability of mobile phones in a productive way since mobile phones are constrained by processing power, memory necessities and battery limit. The augmented execution in mobile cloud computing infrastructure is an early technology to increase the capacities of weaker mobile phones by using the services of resource-rich and influential cloud servers. The attention can be given on structure in which offloading decision will be taken by the operating system of mobile phone will take offloading decision. In this paper, an application processing framework is proposed supporting the partitioning approach for partitioning of massive application applied in mobile cloud computing paradigm.

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