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AN APPROACH TO EXTEND MOBILE ENERGY THROUGH OFFLOADING TO CLOUD

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Abstract: Smart Phones are the fastest growing gadgets in recent years. The most important challenge faced by the smart phones are the limited energy capacity of the device. In this paper we extend the smart phone battery life through offloading. Limited energy capacity can be eased off by offloading heavy task to cloud. In proposed system we compared the energy costs for uploading and downloading a multimedia file to and from MCC with the energy costs of encoding the same multimedia file on a smart phone. We present a novel method for storing multimedia files on the cloud to reduce amount of energy consumed. Our results show that Multimedia Cloud Computing based service model provide smart phones with much multimedia functionality and saves smart phones energy from 30% to 70%.

Keywords: Mobile Cloud Computing, Smart Phones,Offloading, Migration

1 INTRODUCTION

Mobile Cloud Computing at its simplest refers to an infrastructure where both the data storage and data processing happen outside of the MT. MCC moves the computing power and data storage away from mobile phones into the cloud, bringing applications and mobile computing to not just smart phone users but also a much broader range of mobile subscribers.

Cloud computing is an emerging paradigm for cost efficient and reliable service provisioning. Today, the rich availability of energy-harvesting and resource-constrained mobile computing devices is beginning to converge with the great opportunity offered by the powerful cloud computing services hosted by virtualized data center resources. Although mobile applications, cloud computing, and data center networking techniques have been

intensively investigated in the past couple of years, mobile cloud computing and mobile cloud networking have not raised the attention of the research community until recently.

02 OBJECTIVE

The Main objectives of MCC are

Extending battery lifetime: Battery is one of the main concerns for mobile devices. Computation offloading technique is proposed with the objective to migrate the large computations and complex processing from resource-limited devices (i.e., mobile devices) to resourceful machines (i.e.,servers in clouds). This avoids taking a long application execution time on mobile devices those results in large amount of power consumption. Improving data storage capacity: Storage capacity is also a constraint for mobile devices. MCC is developed to enable mobile users to store/access large quantities of data in the cloud through wireless networks.

Improving processing power: MCC also helps in reducing the running cost for compute-intensive applications that take long time. MCC can provide a better user experience reducing time of execution,especially in mobile edge computing.

Improving reliability: Storing data or running applications in clouds is an effective way to improve the reliability because the data and application are stored and backed up on a number of computers. This reduces the chance of data and application lost in the mobile devices. In addition, MCC can be designed as a comprehensive data security model for both service providers and users.

03. LITERATURE SURVEY

This Article [1] explores about Mobile systems which have limited resources, such as battery life, network bandwidth, storage capacity, and processor performance. These restrictions may be alleviated by computation offloading: sending heavy computation to resourceful servers and receiving the results from these servers. Many issues related to offloading have been investigated in the past decade. This survey paper provides an overview of the background, techniques, systems, and research areas for offloading computation.

This Article [2] describes about Task offloading from smart phones to the cloud which is a promising strategy to enhance the computing capability of smart phones and prolong their battery life. However, task offloading introduces a communication cost for those devices. Therefore, the consideration of the communication cost is crucial for the effectiveness of task offloading. To make task offloading beneficial, one of the challenges is to estimate the energy consumed in communication activities of task offloading. Accurate energy estimation models will enable these devices to make the right decisions as to whether or not to perform task offloading, based on the energy cost of the communication activities.

This Article [3] describe about Mobile applications which are becoming increasingly ubiquitous and provide ever richer functionality on mobile devices. At the same time, such devices often enjoy strong connectivity with more powerful machines ranging from laptops and desktops to commercial clouds. This paper presents the

design and implementation of Clone Cloud, a system that automatically transforms mobile applications to benefit from the cloud. The system is a flexible application partitioner and execution runtime that enables unmodified mobile applications running in an application-level virtual machine to seamlessly off-load part of their execution from mobile devices onto device clones operating in a computational cloud. Clone Cloud uses a combination of static analysis and dynamic profiling to partition applications automatically at a fine granularity while optimizing execution time and energy use for a target computation and communication environment. At runtime, the application partitioning is effected by migrating a thread from the mobile device at a chosen point to the clone in the cloud, executing there for the remainder of the partition, and re-integrating the migrated thread back to the mobile device

This Article[4] describe about Extend the battery life of mobile handsets at different levels such as operating system, wireless technologies and applications is the aim of the most hardware manufacturers and OS designers, so designing more energy efficient applications and operating systems is the best way to solve this problem, In this paper, we aim is to provide a summary of techniques employed in mobile computer and especially smart phones operating systems that can reduce the power consumption of today's mobile computing devices.

This Article[5] describe about The inherently limited processing power and battery lifetime of mobile phones hinder the possible execution of computationally intensive applications like content-based video analysis or 3D modeling. Offloading of computationally intensive application parts from the mobile platform into a remote cloud infrastructure or nearby idle computers addresses this problem. This paper presents our Mobile Augmentation Cloud Services (MACS) middleware which enables adaptive extension of Android application execution from a mobile client into the cloud. Applications are developed by using the standard Android development pattern. The middleware does the heavy lifting of adaptive application partitioning, resource monitoring and computation offloading. These elastic mobile applications can run as usual mobile application, but they can also use remote computing resources transparently. Two prototype applications using the MACS middleware demonstrate the benefits of the approach. The evaluation shows that applications, which involve costly computations, can benefit from offloading with around 95% energy savings and significant performance gains compared to local execution only.

This Article [6] describe about As energy efficiency has become a key consideration in the engineering of mobile applications, an increasing number of perfective maintenance tasks are concerned with optimizing energy consumption. However, optimizing a mobile application to reduce its energy consumption is non-trivial due to the highly volatile nature of mobile execution environments. Mobile applications commonly run on a variety of mobile devices over mobile networks with divergent characteristics. Therefore, no single, static energy consumption optimization is likely to yield across-the-board benefits, and may even turn to be detrimental in some scenarios. In this paper, we present a novel approach to perfective maintenance of mobile

applications to reduce their energy consumption. The maintenance programmer declaratively specifies the suspected energy consumption hotspots in a mobile application. Based on this input, our approach then automatically transforms the application to enable it to offload parts of its functionality to the cloud. The offloading is highly adaptive, being driven by a runtime system that dynamically determines both the state-to-offload and its transfer mechanism based on the execution environment in place. In addition, the runtime system continuously improves its effectiveness due to a feedback-loop mechanism. Thus, our approach flexibly reduces the energy consumption of mobile applications behind the scenes. Applying our approach to third-party Android applications has shown that it can effectively reduce the overall amount of energy consumed by these applications, with the actual numbers ranging between 25% and 50%.

06. PROPOSED SYSTEM

In proposed system the user can able to store and retrieve the multimedia file without the use of mobile storage. In this system the user can store data (multimedia files) in cloud storage.

The user can view his data anywhere because we are uploading the data in cloud storage. In the proposed system we are using the offloading technique to upload the multimedia files into the cloud.

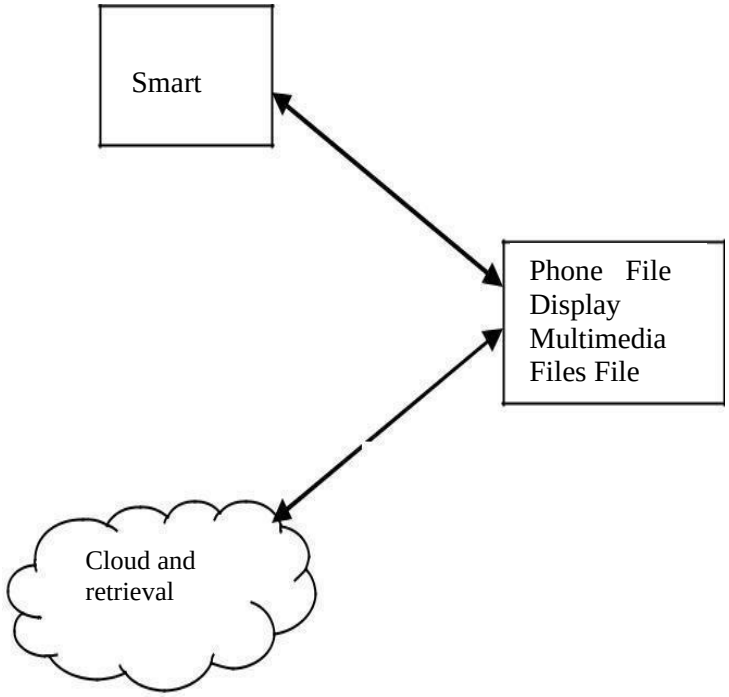
Searching of multimedia files is easy in this method as we are using date filter technique to locate the multimedia files in the cloud. Our proposed system provides security to the user personal multimedia files and no one can view the files.

The user data can't be erased or lost. More amounts of multimedia files on the Smartphone will reduce the performance and energy of Smartphone. But in this system since the data are stored in the cloud storage the performance and energy of the
Smartphone's gets increased.

ADVANTAGES

Reducing the Smartphone energy significantly and thus increasing the performance of the Smartphone.
The user can able to store and retrieve data without the use of external memory.
The uploading of files is made easy by allowing not only the text files but also other files like images, audio, video which are offloaded to the cloud.
The user can store the files in the cloud by providing security which protects the information from the unauthorized user.

05. ARCHITECTURE DIAGRAM



ANALYSIS OF THE SYSTEM REQUIREMENTS

According to the functional requirements for the system, three sub-modules can be designed for the system as following illustrate:

Module 1: Linking to the cloud storage.

Module2: Upload multimedia files to cloud.

Module3: Searching and viewing the multimedia file

06. MODULES

MODULE1: LINKING WITH CLOUD STORAGE The files that are to be transferred from the smart phone to the cloud should be sent primarily via a secured medium. This is achieved in this module by allowing only authenticated user to link with the cloud storage. Authentication is the process which allows a sender and receiver of information to validate each other. Each user registers initially (or is registered by someone else), using an assigned or self-declared password. On each subsequent use, the user must know and use the previously declared password. Those users are to be provided a proper username and password for a successful authorization.

The link tab is used in order to link the user with the cloud. This is down only when the system recognizes the proper user.User authentication is a means of identifying the user and verifying that the user is allowed to access some restricted service

MODULE 2: UPLOAD MULTIMEDIA FILES TO CLOUD

Once the user has been granted authorization, then the user can offload the heavy task which is in the local storage (Smartphone) to that to the cloud. The files that are to be transferred can be any multimedia files such as text, image, audio or video. Only the multimedia files with correct format that is recognized are allowed to be offloaded. The files that are stored in the cloud can be used for viewing also which reduces the time and energy needed for transferring the file in the local storage frequently for viewing. The multimedia files are uploaded in cloud storage using offloading method. Offloading method is mainly used to upload data to server or cloud using 3G and Wi-Fi. Offloading is an effective method for extending the lifetime of handheld mobile devices by executing some components of applications remotely (e.g., on the server in a data center or in a cloud).For the end users the purpose for doing mobile data offloading is based on data service cost control and availability of higher bandwidth.

MODULE 3: SEARCHING AND VIEWING FILES

The files that are stored in the cloud are to be retrieved for further use. This can be done by searching option which is done efficiently where the user provides the date of the file of transfer and the cloud server groups the files and displays only the files of the corresponding dates. The date which is to be provided should be in the correct format of date, month, and year. Any date which is not in this format cannot be used for searching. The files can be viewing with an additional information called as tagging which is used to attach the exact location of where the files has been created.Searching and viewing the multimedia files using date filter are to be retrieved for our future use. In this module the user can search and view his files anywhere.

Now the user is allowed to view the list of multimedia files that was uploaded into the cloud. In this view application the user can easily recognize the files that were uploaded. The user can view and search any kind of multimedia files such as text, audio, video, and image. The multimedia files that are with correct format that is offloaded are allowed to view and search using date filter which is in the format of date, month and year.

07. CONCLUSION

The problem of running multimedia application on Smartphone is addressed, and thus investigating the benefits of using MCC framework in this regard. MCC appears to be promising to fill the gap between Smartphone performance limitations and expectation of the users by the Energy-as-a-Service (EaaS) service. The experiments are conducted for evaluating the benefit of MCC to overcome Smartphone Constraints. The results reveal that the potential of MCC reduces Smartphone energy consumptions on multimedia applications. This

clearly indicates that offloading multimedia applications from Smartphone to MCC is beneficial. MCC significantly reduces the energy consumption on Smartphone by the EaaS service.

The limitation is that we need network connection to upload the files into the cloud otherwise files cannot be uploaded into the cloud. The time taken to upload a file in 3G network is more compared to that of uploading a file in WIFI.

08. FUTURE ENHANCEMENTS

More experiments are to be conducted in order to generalize our finding which include playing games etc. Optimum algorithms, architectures, and implementations for this offloading technique are needed to reach best offloading case. This study opens up new opportunities to be investigated. Finally, modeling the mcc to handle the offloading is important to implement efficient offloading.

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