

Improving Energy Efficiency of Android Device Using as an Energy Service

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Abstract

In recent years, the use of Smartphone in daily life is increased in large amount. But the Smartphone have certain limitation like energy, memory and processing. In today's world the memory and processing has been solved up to certain extent but problem of limited battery energy has not been solved satisfactorily. By using cloud computing technology, the limitation of energy capacity can be eased off in cheap manner by offloading heavy task to the cloud. In this paper we calculate the energy cost of multimedia application and also database on Smartphone by using multimedia cloud computing (MCC). We also create a large database on cloud as well as on Android Device and by query we estimate the comparison between them while data fetching and processing. By doing experimental setup we are going to investigate that whether Smartphone is able to save energy or not and feasibility of cloud computing as Energy as a Service (EAAS). We will compare energy consumption by using HTTP and FTP on internet with 3G and Wi-Fi. By comparing energy comparison we will able to show that Energy as a Service is able to save the Smartphone energy up to 30 to 70%.

Keywords

Energy as a Service, Multimedia Cloud Computing, Energy Consumption, Cloud Computing.

I. Introduction

In this modern era, the use of Smartphone is increasing widely because of their functionalities and capabilities. Today's Smartphone are able to work as a personal computer. But Smartphone have certain limitation like energy, capacity and memory. In recent years, the problem such as capacity and memory has been solved up to certain limit. These Smartphone works on battery which are limited in size and therefore capacity. So problem of energy capacity has not been solved satisfactorily.

Cloud Computing (CC) is new promising technology in various aspects like resource sharing, low maintenance and availability. We can use cloud computing as a data centre in which we can process, network and store the data for the user with on demand basis functionalities. If cloud computing is able to provide multimedia functionalities on demand basis then it is called as Multimedia Cloud Computing (MCC). MCC can access any multimedia data which is available on internet and provide that data to user on demand in any format on the demand of user by universal resource locator. Cloud provides more energy efficient solution than traditional system. In the traditional system large number of server were present with low efficiency and high energy consumption. But in opposite to this in cloud system small number of server are present with high efficiency and low consumption. It does not require much cooling system.

II. Methodology

In this proposed system consists of following stages

- A. Create a large database on cloud
- B. Create same database on Android Device
- C. Query from cloud database and mobile database via Android Code and do the comparison between them.

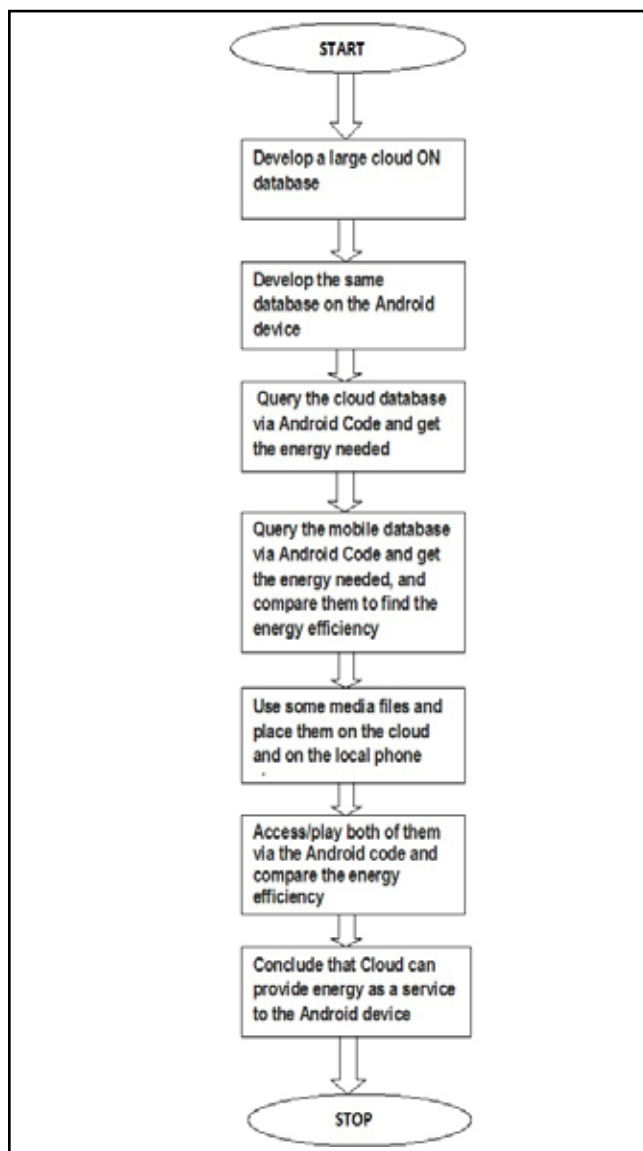


Fig 1 : Flow Chart of Project

III. Design Consideration

The following terms we will include in the consideration:

(i) Create a large database on Cloud

We will make a database, written on PHP code to perform high memory database operations. After performing a various database operation we will get regarding output on system.

(ii) WAMP Server

We will see the output of created a large database on cloud by using wamp server. Wamp server is local server package for windows, allowing you to install and host web applications that use Apache, PHP and MySQL.

By using Wamp server we will be able to manage out Apache and MySQL services, manage our server setting and able to access our logs and settings files.

(iii) Creation of same database on Android Device

We will create the same database on Android Device. We will create a code and we run that code on any android device. After running that code on device we will query from it and note down the time it will take.

IV. Block Diagram

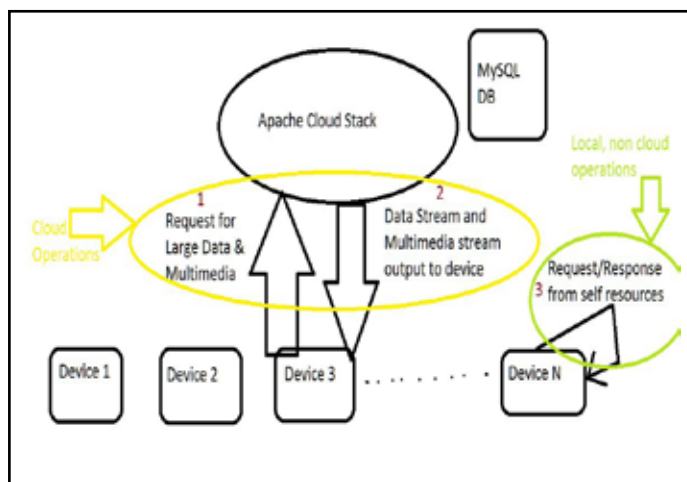


Fig. 2 : Block Diagram

As per shown in the block diagram, this is the basic working of cloud. We can connect many android device or Smartphone to cloud at time. We will fetch the data from the cloud. Here we perform the two operations as per following

1. Fetching and processing data from cloud
 In this operation, whatever data we created in the form of large database, we will fetch and process. We stored that data in the cloud. We will fetch it from cloud.
2. Fetching and processing data from android device
 In this operation, the same database which we have already created and stored in cloud, the same database we stored in the android device or smartphone. We fetch and process the data from android device.

These two operations we will perform and we calculate energy consumed in every operation. After getting the values of energy consumption, we compare the performance of it. From the evaluation of this we will check whether or not it is able to save energy. By these value we will conclude that will it work as energy as a service or not.

V. Why Cloud Computing?

The cloud computing is a new computing paradigm, which is considered as an alternative to old information technology. Cloud computing narrowly as an updated version of utility computing ; basically virtual servers available over internet. It creates service oriented architecture by providing software and platform as services. It provides service on demand basis by the user.

Cloud computing provides many benefits. We mention some of the benefits here as per the following:

- I. It provides resource sharing and low maintenance.
- II. It requires fewer servers as compare to traditional information system.
- III. In traditional information technology cooling system is also required so indirectly it also consume energy and as compare to this less cooling system is required in cloud. So energy consumption is reduced in cloud computing.
- IV. If users don't want to run, install and store the application then cloud computing is better option. Whatever data is required by the user nad which is available on cloud, user can access that without installing any application on device. So eventually it saves device energy.
- V. Because of cloud computing accessibility is improved. User can access anywhere, anytime.
- VI. It provides almost unlimited storage. It is increasing storage capacity also with energy consumption.
- VII. It also provides automatic update of softwares. It is not necessary to do the update personally.
- VIII. Cloud can provide the service on demand basis. So cloud is used a platform as a service, Infrastructure as a service and here we are trying to use cloud as a Energy as a service. We are trying to save energy of android device using clouds benefits.

VI. Conclusions

Android Mobile Application would be developed using Java with PHP Based cloud would be used for development. We are going to add Multimedia Cloud Computing Technology, which provide better cloud infrastructures for media services , enhanced networking capabilities for media delivery and enriched mobile devices for media access and rendering.

We would be adding the concept of multimedia and text based processing to our system. The final but most important step in our experiment is to analyze the output from the comparison of offloading heavy application, namely Multimedia Application, from Smartphone as a energy service. After using Multimedia Cloud Computing we obtain reducing Smartphone energy consumptions on multimedia application.

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Author's Profile



My name is Devashree Ashok Powar. I have completed BE from Mumbai University in 2011 with first class and presently pursuing ME from Mumbai University.