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Offloading Framework for Mobile Cloud Computing

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ABSTRACT

The latest development in mobile device has change user experience of using smart device. The smartphone provide application for users since the usage of mobile device in recent years is still lack from the low potential computing device, memory usage, and battery lifetime. The cloud storage is used to store large amount of data as depend on capacity provided. Cloud is depend on capacity storage provided to the technique for storing data which it transfer from mobile to cloud is known to be mobile cloud computing. The computation offloading is procedure to migrate intensive computation from mobile to resource –rich cloud. The computation based on cloud is used to reduce the memory space, battery usage and execution time. The data which is send from mobile to cloud is secured by using algorithm and security layer.

Keywords: Application Models, Mobile cloud computing, Computational offloading, security, Smartphone

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I. INTRODUCTION

Cloud computing is becoming important among the user which gained much attractiveness in recent year. Cloud Computing provide with various utilities, storage, service, application and many other functionalities over the internet. Cloud Computing provides resources to many other users' to access it through internet. Cloud provides various functionality such as for example SAAS (Software as Service), IAAS (Infrastructure as a Service) and PAAS (Platform as a Service).Computing refers to mean to activity requiring advantageous from or forming computers. Similarly, to the cloud, smartphones are used in high range of application which also gaining popularity, such as online social network, gaming, image processing, file transferring and many more. Mobile application are mostly depends on the wide storage space requirements and most of energy consumption. To utilize the limit of storing in mobile device we use a concept known to be Mobile Cloud Computing. The application offloading which increment turnaround time of vitality utilization on cell phone. Software level changes are more effective where computation is used to perform on remote resources with used of smartphone. The security is been provided for transferring data from mobile to cloud for storage purpose .The cloud usually consists of hybrid cloud where it is available for user to access the benefit concept. The Mobile device and cloud together form MCC(Mobile Cloud Computing).The advancement in recent years, smart device is still low potential and mobile application on latest generation of smartphones is constrained with battery power, CPU potentials and memory capacity. The advancement in recent years, smart device is still low potential and mobile application on latest generation of smartphones is constrained with battery power, CPU potentials and memory capacity. The concepts called framework used for handling intensive mobile application. The computational offloading framework is treating in extensive cellular software in cellular cloud computing. System is utilized for offloading the convenient application at various dimensions and setting up appropriated granularity level at application handling stage at runtime. By utilizing various applications offloading system actualize dynamic application profiling and apportioning methods for, here user is used to login to appropriate application provide to it with security is done through user Gmail account for verification.Onces the user is login to application he can get access of uploading, downloading, searching the files such as word docs, pdf, images, videos etc., which can be visible in mobile device

1.1 Mobile Cloud Architecture

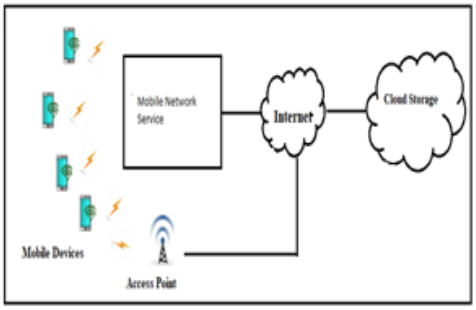

Fig.1.1. Mobile Cloud Architecture

In mobile cloud architecture diagram we can see that the mobile device can be access the service of cloud storage in 2 ways by mobile network and by access point. In mobile network which consist of satellite or cellular smartphones which are connected to base station. The internet connectivity to user is done by telecom network If user want to access cloud based network, if he have mobile network connectivity we can access through cloud based service through internet. The Wireless connection is provided to access the data through internet. The computational offloading starts with workflow of execution of application

1.2 Computational offloading process:

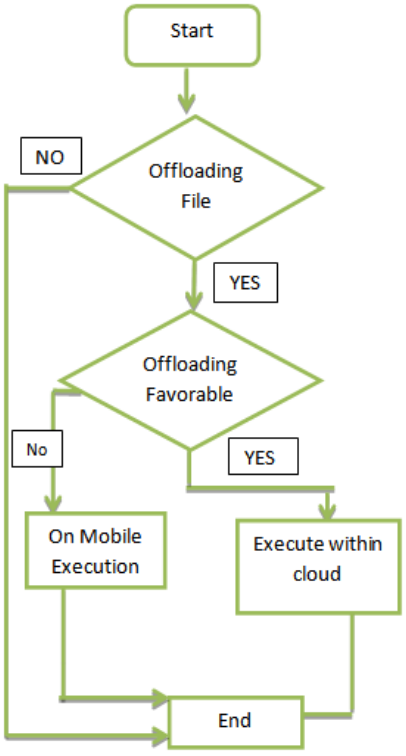

Fig: 1.2 Computation Offloading Process

The basic workflow of computation offloading process starts with execution of application. The user offload the file to cloud if file is successfully offloaded then application checks the connectivity to cloud. The next step is to check the offloaded facts is favorable, if yes then completed within cloud remotely otherwise domestically execution is achieved on mobile device. The data store on offloaded then application checks the connectivity to cloud. The next step is to check the offloaded facts is favorable, if yes then completed within cloud remotely otherwise domestically execution is achieved on mobile device. The data store on cloud and we can excess anytime anywhere. For uploading data in the cloud we require firebase, Google cloud Engine cloud. Uploading data in the cloud we require firebase, Google cloud Engine cloud. Cloud we require firebase, Google cloud Engine cloud.

1.2.1 Entities in computational offloading are:

• User 	• Network Data Cost • Energy • Cloud Service Cost • Application Support
• Connection 	• Technology used (4G/3G/Wi-Fi) • Bandwidth
• Smartphone 	• CPU Speed • Memory • Storage
• Cloud Service 	• Memory • Computational Power • Runtime Support

TABLE. 1.2.1. Entities in computational

Offloading

- User: A user can enable or disable the computational offloading based on network and data. For instance user can offload data on cloud so that he can save energy, enhanced the performance of application.
- Connection: The connection consists of Wi-Fi which provides high bandwidth and shorter delay.3G/4 G connections that charge for bandwidth usage are used. Smartphone: Smartphone provide great development in term of hardware resource. Smartphone are equipped with high performance, memory, processor, sensors and storage.

- Cloud service: Cloud services are used for large amount of storage and use to store data in it.

Overall performance may additionally decrease because of additional computation and put off involved in offloading method.

II. LITERATURE SURVEY

1. **Ahmed E.Youssef and ManalAlageel** [1] "A Framework for Secure Cloud Computing" this paper is used to proposed the challenges in security and privacy. The framework is used to proposed generic cloud security. It also maintains cloud specific risks and attacks and also the advice on security and consideration should be taken when using cloud computing environment.

2.Byung-Gon Chun SunghwanIhm,PetrosManiatis[2]"Clone Cloud: Elastic Execution between Mobile Device and Cloud "This paper provide a step toward interfacing between mobile and cloud .The paper use to give the overcome challenges of design and implementation of basic augment execution of mobile application on cloud and representing transfer control from mobile device to clone and vies versa.

3. RoelofKemp,Nicholas Palmer, ThiloKielmann, and Henri Bal [3]"Cuckoo: A Computation Offloading Framework for Smartphones" this paper is used to present there discovered technique which helps to reduced energy consumption on smartphone with increase in speed of operation.It is also used for deciding runtime at computational stage and also integrates with open source android framework and eclipse development tool.

4. Eduardo Cuervoy, ArunaBalasubramanianz, Dae-ki Cho [4] "MAUI: Making Smartphones Last Longer with Code Offload "In this paper, MAUI is a system that offload enable energy-aware mobile code to infrastructure. MAUI provides benefits of maximizing energy while offloading code and manages code to reduce burden on programmer.

5. D.Kovache, Y.Cao, andR.Klammma [5] "Mobile cloud computing: A comparison of application models "this paper gives concept of cloud computing which is emerging concept in computing fields. The aim focus towards cloud is delivery of require services, capacity is process through internet, and flexible to increase storage .In order to better understand and building mobile cloud application for better understanding of mobile cloud computing is build which helps to construct more powerful application.

III. APPLICATION MODELS:

The application model are used to designed a particular objectives, such as executing application to local execution and remote execution .The primary objectives of performance based application models is to enhance the performance of mobile device application by utilizing cloud resource.

1. **Clone Cloud:** that is based on increased execution techniques which offload a part of execution to nearby infrastructure or cloud .Clone Cloud does not require programmer assist for the conversion of software, and offloads a part of application execution from the mobile device to the clone. In clone cloud, the process of application partitioning is fully dynamic. The main components of the clone cloud are node manager, migrator, database, and profiler and partition analyzer. The advantage of this model is that once a cellphone is lost or destroyed, the clone may be used as a backup for the recuperation of data and application. Example: In document search, the cellphone can keep massive quantity of documents in it in which searching can be completed in couple of minutes. By using mobile cloud computing the search function can execute on smartphone in cloud which result in high performance and energy efficiency hence this application can be developed by using Clone Cloud.

2. **MAUI**: The MAUI uses to minimize various energy consumption offloading method and technique to predict the execution on mobile devices. In this model usually offloading is done on method instead of whole application. In MAUI consists of component such as: a)
3. Profiler, b) Solver interface, 3) client proxy. The solver interface relates with offloading decision maker, profiler collects data about application energy, with client proxy transactions is done with method offloading and data transfer. Example: MAUI application is used for huge image handling tasks, the image tools can offload heavy computational operation to cloud. Gaming application for user interaction requires larger computation and response time.

4. **3. Cuckoo**: The offloading cuckoo application to cloud is easy for developer for programming which is designed for android platform. The primary point of this application is to help restricted offloading to cloud and uses for application improvement. Example: Cuckoo application is utilized for complex scientific estimation, cell phone can offload huge calculation to cloud that may expand vitality

productivity and improve computational intensity of cloud.

IV. CONCLUSION

In this paper different application models are used to offload the data into cloud. Based on framework cloud security model benefits requirements such as security and privacy to satisfy the condition based on cloud and protect them against various threats. In future research should be towards, managing risk in cloud computing is challenging process. Security for clone is use to secure from illegal access and preventing smartphone from various threats. To handle this new mobile cloud application framework is required.

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