# Process Batch Offloading Method for Mobile-Cloud Computing Platform

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## ABSTRACT

*Mobile cloud applications transfers the computational power and data storage outside the mobile device and into the mobile cloud, getting mobile computing and mobile applications to not handheld devices users but a wider choice of mobile subscribers. Process offloading is the technique in which some part of the application is transferred into the mobile cloud for execution. Many applications like GPS, face recognition, video editing etc. consumes more battery of the mobile devices. By offloading the power hunger part to the cloud is one of the approach to elongate the battery lifetime of mobile devices. The major goal of the proposed model is to combine the similar processes into single batch and offload the batch into cloud rather than offloading a single process into cloud. A MPCEPGM (Multilevel Process Cost Evaluation with Process Group Merging) algorithm is proposed for application partitioning and offloading to the cloud. MPCEPGM will predict the overall execution cost of the whole batch or process tree as single entity. This will help the mobile offloading procedure to organize the processes according to their delivery time. Proposed model is energy efficient to deliver the data effectively to the mobile cloud. The performance of the proposed system is assessed on the basis of total execution time and communication cost using Matlab simulations.*

*Keywords: Application Partitioning, BBAP, CPU Cycles, Mobile Cloud Computing, MPCEPGM, Offloading*

## 1. INTRODUCTION

Cloud computing deals with the distribution of computing resources over the internet. Cloud computing offers a bulk of resources like networks, computer processing power, data storage space, specialized corporate as well as the user application. Cloud computing is a technique which provide convenient and on demand network access (Satyanarayanan, 2010). It also provide bulk of computing resources in addition to minimum management services used for interaction.

Cloud Computing (CC) supports suitable, network access on-demand to a collective pool of configurable computing resources (such as services, applications, servers, storage and networks)

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that can be easily used with minimal effort or interaction required by the management and service providers. Mainly Three basic fundamental structure of cloud computing namely cloud service Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Software as a Service (SaaS) (http://www.mobilecloudcomputingforum.com/).

Figure 1 illustrates the four tiers of the cloud architecture. In the layered architecture, top tier is the cloud applications (User Layer) that provides all the cloud applications to the end users. These applications are provided by the bottom SaaS layer on pay-per-use basis. The next tier is the cloud programming (SaaS layer) that includes the software frameworks and creates user interfaces that are cost-effective. The next tier is the cloud middleware (PaaS Layer) that implements all the platform services. It provides run-time environments for executing user applications. The bottom tier is the cloud resources (IaaS Layer) that provide the physical resources to power the data-centers.

Mobile cloud computing is defined as a combination of Mobile internet, mobile computing and cloud computing technologies. Mobile Computing Technology (MCT) (Hunt and Scott et al., 1998) can be used to transfer data and to share resources of computer and cellphones. It gives an accurate and real time information to a client at any time, at any place. Mobile Internet Technology (MIT) is the mixture of internet and mobile communication. It plays an important role to provide network services and real time network resources to a client. Mobile Cloud Computing (MCC) includes mobile computing, cloud computing, virtualizations and networking. MCC gives us challenges and new possibilities in energy saving by supply of computing resources, mobile resources and network resources to increase resource utilization, virtualization and sharing so that reduction in cost can be achieved.

*Figure 1. Cloud computing stack [2]*