Chapter 2

A Study on Software Development Architectures for Mobile Cloud Computing (MCC) for Green IT: A Conceptual Mobile Cloud Architecture Using Artificial Bee Colony–Based Approach

D. Jeya Mala
Thiagarajar College of Engineering, India

ABSTRACT

Mobile Cloud Computing (MCC) at its simplest form refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device. In this chapter, a study on existing software architectures for MCC is outlined with their way of working. Also, a Nature inspired Artificial Bee Colony (ABC) based architecture has been proposed to provide reliable services from the cloud to the mobile requests. The proposed approach will definitely pave a way for timely services by using three different agents working in parallel, which mimics the behavior of honey bees namely Employed Bees, Onlooker Bees and Scout Bees. As the service discovery from the UDDI, Mobile profile Analysis and Allocation of Cloud resources for the requests are done by these software agents in a parallel execution, it achieves a green IT solution for MCC based software Development.

INTRODUCTION

There are several reasons that motivate Mobile Cloud Computing (MCC), as the Mobile devices (e.g., smartphone, tablet pcs, etc.) are increasingly becoming an essential part of human life, and the dream of “Information at your fingertips anywhere anytime”. But Mobile devices still lack in resources compared

DOI: 10.4018/978-1-4666-9916-8.ch002
A Study on Software Development Architectures for Mobile Cloud Computing

to a conventional information processing device such as PCs and laptops. It has been attracting the attentions of entrepreneurs as a profitable business option that reduces the development and running cost of mobile applications, of mobile users as a new technology to achieve rich experience of a variety of mobile services at low cost, and of researchers as a promising solution for green IT.

Nowadays, the market of mobile phones has expanded rapidly. By the end of 2014, the number of mobile cellular subscriptions worldwide reached approximately 6.25 billion, 500 times the 1990 number. The widely use of mobile phones lead to the prosperity of mobile services. Dream of “Information at your fingertips anywhere, anytime” has become true. However, mobile devices still lack in resources compared to a conventional information processing device such as PCs and laptops.

Also, the limitation of battery restricts working time. The strategy to augment the capability of mobile phones has become an important technical issue for mobile computing. The paradigm of cloud computing brings opportunities for this demand. Cloud computing provides new supplement, consumption, and delivery models for IT services. Cloud-based services are on-demand, scalable, device-independent and reliable. Thus, there comes Mobile Cloud Computing, which aims at using cloud computing techniques for storage and processing of data on mobile devices, thereby reducing their limitations.

BACKGROUND

According to the white paper of Aepona (2010), MCC is described as a new paradigm in which the data processing and storage are moved from the mobile device to powerful and centralized computing platforms located in clouds. These centralized applications are then accessed over the wireless connection based on a thin native client or web browser on the mobile devices.

Some of the typical applications of MCC are: Yang et al. (2010) and Dai and Zhou (2010), proposed a 3G E-commerce platform based on cloud computing. This paradigm combines the advantages of both 3G network and cloud computing to increase data processing speed and security level based on PKI (public key infrastructure).

For practical system, a telemedicine homecare management system proposed by Tang et.al.(2010) is implemented in Taiwan to monitor participants, especially for patients with hypertension and diabetes. The system monitors 300 participants and stores more than 4736 records of blood pressure and sugar measurement data on the cloud.

Doukas et al. (2010) proposed ‘@HealthCloud’, a prototype implementation of m-healthcare information management system based on cloud computing and a mobile client running Android operating system (OS). This prototype presents three services utilizing the Amazon’s S3 Cloud Storage Service to manage patient health records and medical images.

Zhao et al. (2010) presented the benefits of combining m-learning and cloud computing to enhance the communication quality between students and teachers. In this case, smartphone software based on the open source JavaME UI framework and Jaber for clients is used. Mobile game (m-game) is a potential market generating revenues for service providers. Here, the m-game can completely offload game engine requiring large computing resource (e.g., graphic rendering) to the server in the cloud, and gamers only interact with the screen interface on their devices.

MeLog proposed by Li and Hua (2010) is an MCC application that enables mobile users to share real-time experience (e.g., travel, shopping, and event) over clouds through an automatic blogging.

www.igi-global.com/e-resources/library-recommendation/?id=107

Related Content

Big Data and Its Visualization With Fog Computing


A Study on the Performance and Scalability of Apache Flink Over Hadoop MapReduce
[www.igi-global.com/article/a-study-on-the-performance-and-scalability-of-apache-flink-over-hadoop-mapreduce/219361?camid=4v1a](www.igi-global.com/article/a-study-on-the-performance-and-scalability-of-apache-flink-over-hadoop-mapreduce/219361?camid=4v1a)

An Adaptive Cloud Proto Type Model for Health Care System: An Adaptive Cloud Proto Type Model for Health Care System Using Software Defined Network (SDN)
[www.igi-global.com/chapter/an-adaptive-cloud-PROTO-type-model-for-health-care-system/164577?camid=4v1a](www.igi-global.com/chapter/an-adaptive-cloud-PROTO-type-model-for-health-care-system/164577?camid=4v1a)