Chapter 98

QoS in the Mobile Cloud Computing Environment

Zhefu Shi
University of Missouri – Kansas City, USA

Cory Beard
University of Missouri – Kansas City, USA

ABSTRACT

Mobile Cloud Computing (MCC) integrates cloud computing into the mobile environment and overcomes obstacles related to performance (e.g., bandwidth, throughput) and environment (e.g., heterogeneity, scalability, and availability). Quality of Service (QoS), such as end-to-end delay, packet loss ratio, etc., is vital for MCC applications. In this chapter, several important approaches for performance evaluation in MCC are introduced. These approaches, such as Markov Processes, Scheduling, and Game Theory, are the most popular methodologies in current research about performance evaluation in MCC. QoS is special in MCC compared to other environments. Important QoS problems with details in MCC and corresponding designs and solutions are explained. This chapter covers the most important research problems and current status related to performance evaluation and QoS in MCC.

1. INTRODUCTION

Cloud computing is considered as the next generation’s computing infrastructure. Cloud computing provides services such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS). Cloud providers, such as Google, Amazon, and Microsoft, are providing more and more applications, including mobile applications. Cloud computing is a large scale economic and business computing paradigm. The cloud computing system provides various QoS guaranteed services such as hardware, infrastructure, platform, software and storage to different Internet applications and users. Cloud computing includes resources of computing and storage. It includes infrastructure layer, platform layer, and application layer (Figure 1).

Mobile Computing is a form of human-computer interaction. Mobile computing is based on a collection of three major concepts: hardware, software and communication. Hardware is mobile devices, such as smartphone and laptop, or their mobile components. Software of mobile comput-
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Figure 1. Cloud service model

MCC is an integration of cloud computing into mobile network. From MCC Forum, MCC is defined as:

**MCC at its simplest refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device. Mobile cloud applications move the computing power and data storage away from mobile phones and into the cloud, bringing applications and mobile computing to not just smartphone users but a much broader range of mobile subscribers.**

Because mobile applications can be quickly released and minimally managed, MCC brings new types of services and facilities. Mobile applications include mobile commerce, mobile learning, and mobile healthcare (Doukas, Pliakas, Maglogiannis, 2010; Rao, Sasidhar, Kumar, 2010; Prasad, Gyani, Murti, 2012).

The development of mobile devices in these years has dramatically changed the wireless landscape for both wireless providers and handset users. For providers, the popularity of iPhone and Android-based phones has been accompanied by