Chapter 1
Mobile Cloud Computing:
An Introduction

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ABSTRACT

Mobile Cloud Computing (MCC) has become an important research area due to rapid growth of mobile applications and emergence of cloud computing. MCC refers to integration of cloud computing into a mobile environment. Cloud providers (e.g. Google, Amazon, and Salesforce) support mobile users by providing the required infrastructure (e.g. servers, networks, and storage), platforms, and software. Mobile devices are rapidly becoming a fundamental part of human lives and these enable users to access various mobile applications through remote servers using wireless networks. Traditional mobile device-based computing, data storage, and large-scale information processing is transferred to "cloud," and therefore, requirement of mobile devices with high computing capability and resources are reduced. This chapter provides a survey of MCC including its definition, architecture, and applications. The authors discuss the issues in MCC, existing solutions, and approaches. They also touch upon the computation offloading mechanism for MCC.

INTRODUCTION

People have always seen the dream of using the computing resources as a utility such as water, electricity, telephone and gas etc. ever since the first computer was developed. Cloud computing is the one of the most promising technology to convert these dreams into reality. Cloud computing is a technology that facilitates the delivery of services by providing hardware and software in data centers over the Internet. The market of mobile phone has grown rapidly. The number of mobile phones worldwide reached approximately 4.6 billion that is 370 times more than its number in year 1990 (Dinh, H.T & Lee, C. & Niyato, D. & Wang, W, 2012). With the increased use of mobile phone lead the dream "Information

at your fingertips anywhere, anytime" become true. But, due to inadequacy of computing and storage resources on mobile phones as compared to PCs and laptops, cloud computing brings opportunities for mobile phones.

Cloud computing provides on-demand, scalable, device-independent and reliable services to its users. The aim of mobile cloud computing (MCC) is to use cloud computing techniques for storage and processing of data on mobile devices, and hence to reduce their limitations. The term MCC was introduced just after the concept of cloud computing that was launched in mid-2007. Since then, it has been drawing attention of organizations to reduce the development cost of mobile applications. It provides the mobile users and researchers a variety of mobile services at low cost. Evolution of cloud computing is shown in Figure 1. Here, we discuss the technologies that have led to the development of MCC.

- **Utility Computing:** It is the process of providing computing and storage services through an on-demand, pay-per-use billing method. Utility computing is a model in which the provider owns, operates and manages the computing and storage infrastructure and the subscribers' access it as and when required on a rental or metered basis.
- **Computer Cluster:** A group of linked computers is called a computer cluster. This group works together closely such that in many respects these computers form a single computer.
- **Grid Computing:** Grid computing is a processor architecture that associates various computer resources to reach a main objective. In grid computing, the computers in a network work together like a supercomputer. A grid works on various scientific or technical tasks that are too big for a supercomputer and requires great number of computer processing power or access to large amount of data.
- **Cloud Computing:** It is a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications. It is a style of computing in which dynamically scalable and often virtualized resources are provided as a server over the Internet.

Figure 1. Evolution of cloud computing
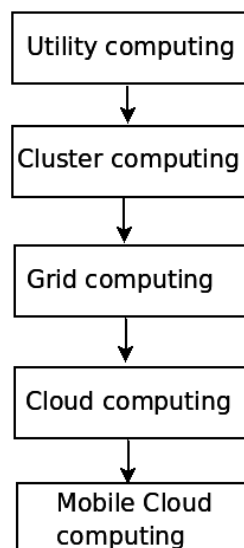
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