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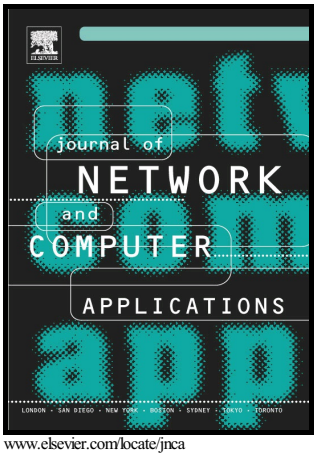

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***Abstract*—The rapid growth of mobile computing is seriously challenged by the resource constrained mobile devices. However, the growth of mobile computing can be enhanced by integrating mobile computing into cloud computing, and hence a new paradigm of computing called mobile cloud computing emerges. In here, the data is stored in cloud infrastructure and the actual execution is shifted to cloud environment so that a mobile user is set free from resource constrained issue of existing mobile devices. Moreover, to avail the cloud services, the communications between mobile devices and clouds are held through wireless medium. Thus, some new classes of security and privacy challenges are introduced. The purpose of this survey is to present the main security and privacy challenges in this field which have grown much interest among the academia and research community. Although, there are many challenges, corresponding security solutions have been proposed and identified in literature by many researchers to counter the challenges. We also present these recent works in short. Furthermore, we compare these works based on different security and privacy requirements, and finally present open issues.**

***Index Terms*—mobile computing, cloud computing, computational offloading, virtualization, security and privacy.**

I. Introduction

THE mobile computing is the fast-growing business solution in the field of Information and Communications Technology (ICT). The number of mobile users is escalating due to constantly improving user friendly hardware and software of mobile devices [1], [2]. At present, the mobile devices such as smartphones and tablets are not only used as a traditional mobile phone but also used as emailing, chatting, internet browsing, running a wide range of applications, file sharing, reading or editing documents, entertaining etc. From the market analysis, it was predicted that the number of usage of tablets and smartphones would be 640 million and 1.5 billion, respectively within 2015 globally [3]. However, the mobile computing alone fails to meet the full satisfaction of the large number of users and their computational requirements.

The mobile cloud computing (MCC) is introduced as services of cloud computing, which is offered in either mobile phone environment or mobile embedded system environment. Mobile computing is integrating with cloud computing because of the essential characteristics of cloud model such as on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured services. Moreover, the cloud computing is being popular to the mobile users as it can provide cloud like services [4], [5]. According to the ABI research report about the increasing popularity of MCC [6], it was forecasted that within 2015, more than 240 million of mobile customers will use cloud services with an earning revenue of $5.2 billion. However, to avail cloud services, mobile devices are depended on wireless communication technologies [7], [8], [9]. The mobile computing is used to show, process, transport and share the applications and resources, whereas wireless communication is used so that the mobile users can utilize the network resources, services and support the communication between mobile devices and clouds. Now a days, there are several emerging applications of cloud computing for mobile users such as application processing [10], [11], [12], cloud storage [13], [14], [15], data sharing [16], cloud mobile media

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