

Editorial: When the Cloud Computing Becomes Mobile!

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Handheld computing devices are now almost everywhere at the hands of technology dependent people of all ages. This rapid expansion of the number of mobile computing users has given rise of various research topics. Both the academia and the industries are looking for new ideas how to best-utilize the mobile computing power at the hands of consumers. While the technological advancements are going on from both hardware and software levels, novel concepts are also being introduced. One of those concepts is Mobile Cloud Computing (MCC).

Mobile Cloud Computing (MCC) basically refers to an emerging infrastructure where both of the data storage and the data processing happen outside the mobile device from which an application is launched. By this time, MCC is a widely accepted concept that can significantly improve the user experience when accessing mobile services. What MCC does is it expands the notion of mere cloud computing. To define formally, the concept of “*Cloud*” tells that the users are able to access ICT (Information and Communication Technology) capabilities from the Internet without knowledge of and full control over the technology infrastructure that supports them. When the users submit any task to the cloud, the exact solution providers and underlying infrastructure are not precisely enumerated. Hence, the users or clients in a cloud service scenario can submit a computing task, such as image processing or some heavy computation tasks, to the service provider without actually possessing the required software or hardware. The client’s computer may contain very little software or data (may be, a minimal OS (operating system) and web browser only), serving as little more than a display terminal connected to the Internet. As the cloud is the underlying delivery mechanism of the client’s task requests and solution provider’s response, cloud-based applications and services may support many types of software applications or services in use today. When the same facility is given to the handheld mobile devices like *Tablets* or *Smartphones* or the

like, it becomes Mobile Cloud Computing—enabling anytime, anywhere computing and storage.

As understood from the above definitions, MCC does not basically make the cloud computing “*mobile*” but rather it could be considered as a wireless extension of cloud service facilities. All the wirelessly connected computing devices use the wireless communication technologies to access the Internet and thus, the resources of the cloud to get the tasks done. This, being the essence of the concept, when the actual cloud infrastructure remains *not-mobile*, many challenges and issues come forward. These challenges not only include the existing challenges faced by traditional cloud computing like security, fair scheduling, resource availability, speed of operation, etc. but also many kinds of issues that are present in wireless communication technologies (e.g., wireless security, wireless infrastructure, channel access, signal interference, and the like). Moreover, one core issue is beyond the concepts and theories that is the “*battery lifetime*” of the handheld mobile devices. All mobile devices use batteries which are mostly rechargeable. Though new technologies of recharging the batteries are still under investigation, which commonly is termed energy harvesting from various sources, the practicality is that still we need to use electricity, supplied by wired connection. Given this aspect, the future of MCC’s expansion lies on the advancements of battery technologies! This is one such example, where no theory or concept may go beyond the practicality of physical implementation of things. We hope that future Mobile Cloud Computing would get the required support from the relevant researchers dealing with electrical and electronics technologies—thus one’s action would help others to grow with more novel ideas and concepts. May be someday then it would be possible to embed the entire *cloud* in mobile computing devices with long steady battery lifetime or lifetime provided by other sophisticated technologies that are still unknown today.