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Survey on Mobile Cloud Computing

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Abstract—In recent few years the development of mobile applications and mobile devices are increased rapidly. With the growth of demand of the mobile applications as well as cloud computing technology, cloud computing has becoming a potential technology for mobile services. Mobile cloud computing takes the advantages of both cloud computing as well as mobile environment and solves the problem related to performance, environment and security. The mobile applications and mobile devices are developing rapidly. Cloud computing is unlikely to bring an embarkation in mobile computing, where the mobile devices can use clouds for task processing, storage and other intensive operations. Lot of peoples use android phones these days and also uses the multiple application. Some of the applications require very large and heavy processing as well as more space. Because of that it slows down the overall performance of system. So we need to run the application on other memory. So we have come up with a solution that this processing will be done on cloud. The security is also provided there if is any breach then alert is send to android phone again. With this multiple application can be processed at a time with the web application.

Keywords— computation offloading, cloud computing, service provisioning, mobile services, mobile cloud computing.

I. INTRODUCTION

The role of mobile devices as service providers is strongly increased as their capabilities and the availabilities of high speed networks. The range of services that involve mobile devices providing data are on the rise, ranging from entertainment services, such as online social gaming and networking, to crowd sourcing, such as video streaming of a current event. However, the wealthy functionalities that such applications offer increasingly demand resources beyond the capabilities of resource-constrained devices. The lack of resources makes the limitations on the types of functionality and services that can be offered by the mobile phone.

The resilient resource provisioning of cloud computing assurance to fill the gap between the limited resources of mobile devices and the growing resource demands of mobile services through offloading resource-intensive tasks. However, offloading such tasks does not always guarantee performance improvements. For example, offloading may impose large data transfer between the cloud and the mobile device, which brings down likely performance benefits and borrow higher latency.

In some cases the mobile device may be unable to afford the energy requirements for such data transfers. In fact, the user may try to avoid the constraint which causing the power waste for some specific applications. Thus, the decision on when to offload the execution on cloud becomes a critical issue to the overall performance of mobile services.

II. BACKGROUND & RELATED WORK

In recent past few years, consequence study has been done on the resource constraints of mobile devices as computing platforms. In this section, we provide a brief background and review the related work from two perspectives: mobile devices as service providers and computation offloading to augment the capability of mobile devices.

Mobile Devices as Service Providers

Little attention of the previous research have been dedicated to investigate computation offloading in service provisioning. Weerasinghe et al. [4] studied reliable mobile service provisioning with respect to availability and scalability. The authors propose a proxy-based middleware to bootstrap the performance of mobile services. The proxy acts as a fixed representative to mobile services. This middleware supports service migration where mobile providers may choose to switch to an alternate server due to close proximity or better connectivity. Hassan et al. [5] present a distributed mobile service provisioning framework that separate the execution of resource-intensive services between the mobile provider and a cloud server. The framework offers a distributed execution engine where tasks that require real time access to local processor are executed on the mobile devices, while the remaining processing is offloaded to a remote server. Their partitioning technique relies solely on the available resources of the mobile device. The execution is entirely performed on the mobile device if available resources satisfy the service execution requirements. In contrast, our framework selects the best execution plan with the minimum response time, while satisfying the resource constraints with respect to both execution requirements and user preferences.

Computation Offloading

Computation offloading transfers processing outside of the mobile device. The objective is to improve the performance, enable advanced functionality, and preserve scarce resources. Offloading may be performed at different granularities ranging from methods and individual tasks to applications and virtual machines.

Mobile Cloud Computing

The Mobile Cloud Computing can be state as follows [1]: “Mobile Cloud Computing at its simplest refers to an environment where both the data storage and the data processing is done outside of the mobile device. Mobile cloud applications move the processing power and storage away from mobile phones and into the cloud, triggered the most applications and mobile computing to Smartphone. Chun [8] describes mobile cloud computing as a new technique for mobile applications in which the data processing and storage are moved from the mobile device to powerful clouds. These applications are then control on the wireless connection based on a thin native client or web browser on the mobile devices.

III. ARCHITECTURE OF MOBILE CLOUD COMPUTING

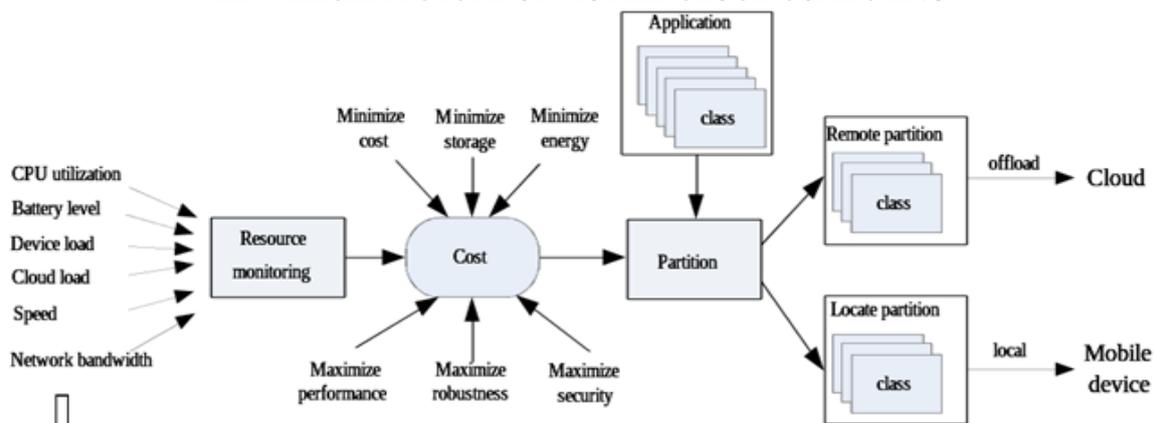


Fig. 1: Mobile Cloud Computing Architecture

In the architecture as given the traditional mobile phones have the limited resources as well as processing power also the battery of mobile phones is limited. But on the other hand the processing power is high, as well as there is not resource limitation and also the power consumption is not big issue there.

The Model for Remote Processing

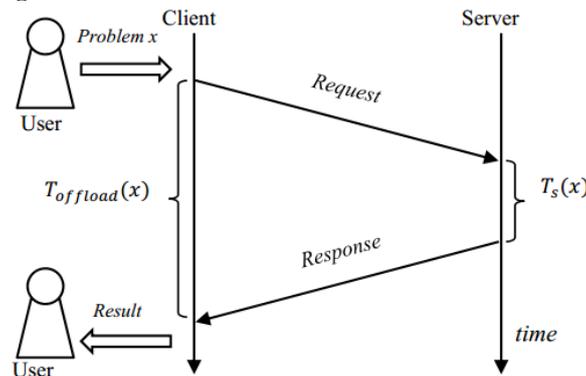


Fig. 2: The Model for Remote Processing

We use the model given in Figure 2 to calculate total processing time when the client request heavy task processing to the cloud. First, the application sends a task to process, and then the application sends a request with the task to the cloud. Next, the server computes the received task and responds a result to the mobile application. Finally, the application shows the result to the user.

IV. ADVANTAGES OF MOBILE CLOUD COMPUTING

1) Extending battery lifetime: Battery is one of the main reason of concerns for mobile devices. Some of solutions have been developed to improve the processor performance and to handle the disk and screen in a smart manner to reduce power consumption. However, these solutions needed to change in the architecture of mobile devices, or they require a new hardware that will increase the cost and may not be feasible for all mobile devices. Computation offloading technique is design with the intention to migrate the large computations and complex processing from resource-limited devices to resourceful machines. This avoids taking a long application execution time on mobile devices which results in large amount of power consumption.

2) Improving data storage capacity and processing power: Storage capacity is also a big problem for mobile devices. mobile cloud computing is developed to enable mobile users to process the large data on the cloud through wireless networks. Mobile cloud computing also helps reducing the running cost for heavy processing applications that take long time and large amount of energy when performed on the limited-resource devices. Mobile applications also are not issue by storage capacity on the devices because their data now is stored on the cloud.

3) Improving reliability: Storing data and running applications on clouds is an effective way to improve the reliability because the data and application are stored on cloud. This reduces the chance of data and application lost on the mobile devices. In addition, mobile cloud computing can be designed with data security model for both service providers and users. The cloud can remotely supply to mobile users with security services such as virus scanning, malicious code detection, and authentication [6].

V. CONCLUSIONS

Mobile cloud computing is one of mobile technology in the future which combines the advantages of both mobile computing and cloud computing, so that providing best services for mobile phones. Cloud computing can potentially save energy and improve performance for mobile users. Not all applications are energy efficient when migrated to the cloud. Cloud computing services would be effective and different from cloud services for desktops because they must offer energy savings. The services must assume the energy overhead for privacy, security, reliability, and data communication before offloading.

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