Volume 6, Issue 1, January 2016 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

A Survey: Energy Conservation in Smartphone's Using Offloading Based Malware Detection

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Abstract: One of the best techniques used for energy conservation in Smartphone is a offloading technique. In this we design malware application which is based on offloading mechanism. It means a task of malware detection is offloaded to cloud. Task offloading is used for energy conservation. Our key goal is to reduce the energy consumption of Smartphone during malicious app scanning. Smartphones are more portable and easy to handle, hence they becomes major part of our day-to-day life. Mobile malware malicious infections arise through installing repackages legitimates apps with malware, updating current. Thus the paper contains the survey of an offloading mechanism that is suitable for implementation in mobile and applicable to cloud computing environment.

Keywords:Cloud computing, mobile computing, offloading mechanism, malware detection, energy conservation.

I. INTRODUCTION

Now days, mobile devices plays important role in our life. One can easily found solution for his problem using applications provides by Smartphone. Also smartphones are rich in user interfaces such as camera, GPS, music player etc. One of the main feature is internet connectivity which provides facility for communication using social media. But these mobile devices are constrained by their small energy storage. Therefore major problem for mobile users is the limited energy capacity of their smartphones. Task offloading from mobile devices to cloud is essential to enhance their computing capabilities and at the same time save their energy. Our proposed solutionintroduces task offloading mechanism to the cloud for conservation of energy. For offloading task it must requires internet connection.

The need to reduce the energy consumption of smartphones has been attracting efforts from many researchers. Many methodologies and techniques have been proposed in literature. Smart batteries, power scheduling, efficient operating systems and applications,."efficient graphical user interfaces, energy-aware communication protocols, and task offloading are all examples of these methodologies and techniques. Task.

offloading is a promising technique to reduce energy consumption in smartphones; specially, with the emergence of high-speed broadband wireless Internet access. That is because high-speed networks increase the connection availability to the computing resources behind the Internet. Using the offloading technique, smartphones can offload their heavy tasks to remote machines and save their energy of executing the task locally. In the era of Cloud Computing (CC), the energy constraint on smartphones can be eased off by offloading heavy tasks from smartphones to the cloud. The mobile device can save energy by offloading heavy tasks to the cloud, and then the cloud executes the tasks and provides the mobile device with the results. For example, a smartphone can upload a video file to a cloud and request to encode the file into a desired format fitting the smartphone capability with less energy consumption than doing the encoding on the device. Task offloading will become vital for the Information and Communication Technology (ICT) in the near future because CC will be a dominant operator for mobile computing. Mobile data storage and data processing will take place on the cloud, and a promising way to have this kind of ICT structure is to employ offloading techniques.

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Offloading in general is defined as, "The process or technique that is used to improve the performance, quality, or efficiency of a computation task by delegating this task completely or partially to a remote computing machine that is usually has a powerful computation capability more than the local machine."

Firstly, as it is invented, the offloading is used for load balancing between servers of a cluster.

Secondly, increasing the response time of an application or reducing the execution time.

Thirdly, the offloading can increase the quality of an application because that the results of a powerful machine definitely are better than if they produced from less computation power.

Fourthly, energy saving could be gained from the offloading technique for energy limited devices such as smart phones.
In general, the offloading technique substitutes many requirements of computing resources. Offloading technique not only satisfies one benefit but also could provide more than one benefit at the same time. For instance, it could provide quality improvement side by side with the energy saving benefit.
we studied that four possible offloading scenarios, as listed in Table 1 and explained in what follows. S1: In this scenario, the input data is available locally on the smartphone and task execution occurs on the smartphone as well. This is the normal case where no offloading occurs. We use this scenario as a reference case for comparison purpose. S2: The second scenario is where the task execution happens on the cloud but the task data exists locally on the smartphone. In this scenario, the smartphone has to upload the task data to the cloud and then download the task results. S3: The third scenario is where the task execution is performed locally on the smartphone, but the task data exists on the cloud. In this scenario, the smartphone needs to download the task data and perform the task execution locally. S4: In this scenario, the input data is available on the cloud and task execution occurs in the cloud as well. Therefore, the smartphone just needs to download the task results.

II. RELATED EXITING TECHNIQUES

The paper [1] introduced states Disco was an asynchronous neighbor discovery protocol for mobile sensing U-connect is another asynchronous discovery protocol for mobile sensing that selects the time slot and improves the performance. Search light combines both probabilistic and deterministic approach to reduce the latency for smartphone. This protocols saves the energy in smartphones but there are some drawback of this protocols. These protocols are not environment friendly and works very slowly.
Cycle-accurate simulator it shows energy consumption at low level therefore they can calculate the energy usage but on the other side it is very slow [2]. In this the energy consumption of software is at instruction model but disadvantage of this system is that it only provides usage of energy at software level but it did not take operating system under it's consideration.
CIST [3] saves energy by keeping in mind the requirement of application instead of examining the behavior of resources. But drawback of this technique is that it only works on Linux operating system and cost is also high.
Device named asleep for smartphone which improve the energy effectiveness of smartphone by putting user's smartphone in sleep mode for a short interval of time without interrupting the user's application. Another technique named waked on wireless. It also saves energy of smartphone. It reduces the smartphone energy by powering off the smartphone and its ratio interface when user is not using phone and power on when there is ongoing traffic [04]. But it works only with smartphones having Android, Symbian OS.
The offloading has been proposed for several purposes such as load balancing, improve the performance, and save energy. The work of Othamn et al. is the early study for offloading a task to save energy on mobile devices [10]. The offloading technique can be categorized into three major approaches based on the type of the remote machine. The first approach is the offloading to a web proxy [8], where a proxy works as an intermediary machine between a web server and a mobile device. The mobile device sends a web request to the proxy and the proxy delivers the content to the mobile device after performing the desired modification to the content, such as multimedia coding. The second approach is the offloading to a local powerful server [12], where the server is located on the same or nearby network as the
mobile device existing. The mobile device sends a computation-intensive task to the server, requests to perform the given task, and then downloads the task results. The third approach is the offloading to a cloud [9], where the cloud provides its ubiquitous computation resources, such as processing and storage, to a mobile device.
Kelenyi et al. [11] proposed a strategy to save energy of handheld devices using CC. In their strategy, cloud servers are used as BitTorrent clients to download torrent pieces on behalf of a handheld device. While a cloud server is downloading the torrent pieces, the handheld device switches to sleep mode until the cloud finishes downloading the torrent pieces and starts uploading the torrent file in one session to the handheld device. This strategy saves energy of handheld devices because downloading torrent pieces from torrent peers consumes more energy than downloading a single burst of torrent pieces from the cloud. However, this strategy only takes into account the impact of the Torrent traffic pattern on the energy consumption and does not consider the computation cost of the given task. In general, the cloud can be used to offload not only a specific task, namely downloading torrents, but also for any computation task, if smartphones can save energy due to offloading. Therefore, estimating the energy consumed for task offloading to the cloud is fundamental to making a task offloading decision.
Malware in current smart devices like–mostly smartphones and tablets have rocketed in the last few years, in some cases supported by sophisticated technique purposely designed to overcome security architectures currently in use by such devices.[5] For example, power consumption is one major constraint that makes unaffordable to run detection engines on the device while externalized techniques rise many privacy concerns.
we finally provide constructive discussion on open research problems where we believe that more work is needed. [6] Our analysis of some representative samples shows that malware is becoming increasingly complex and adaptive, with constantly changing goals and using multiple distribution and infection strategies
Many researchers believe that cloud computing is used to help reduce battery consumption of smartphones, as well as to backup user's data. This communication does not come for free, in terms of both energy consumption of network interfaces to send the data and bandwidth. [7]Several works consider the trade-off between the energy spent to offload specific application modules and the battery saved thanks to the cloud.

So by considering the drawbacks of previous techniques of energy saving ,Our goal in this project is to study the feasibility of mobile computation offloading and mobile software/data backups in real-life scenarios and perform the task of malware detection on cloud instead of smartphone

III. ARCHITECTURE

In Fig. 2 Our system architecture consist of, smartphones and cloud computing ,both linked to the internet. The smartphones are connected to internet through a WLAN access point or a cellular data network base station. the CC part consists of cloud data center and cloud provider, which are accessible through the Internet. The cloud provides the end users (*e.g.*, smartphone users) with all of the CC functionalities that are needed for mobile computing.

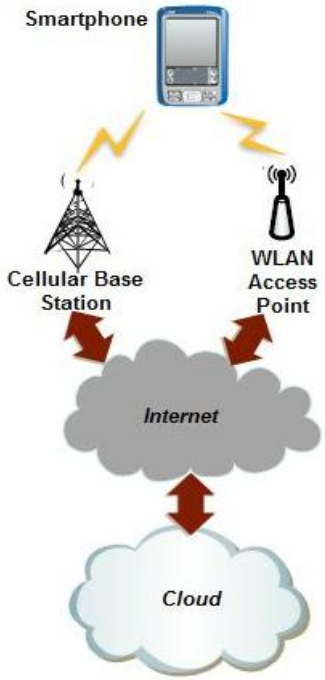

Fig. 2 Architecture Of Proposed System

IV. CONCLUSION

The smartphone become one of the most essential devices on the hand of many people. The advances in the Internet, wireless communication, and the semiconductor technologies contribute to the popularity of the smartphones. However, the limited energy capacity of smartphones slows and limits the growth of smartphones capabilities.

To overcome this limitation of smartphones, our proposed system uses offloading mechanism. The offloading technique promises to save energy and enriches the computing functionality of mobile devices .we also use offloading decision framework to take correct decision of offloading.

ACKNOWLEDGEMENT

Apart from our own, the success of this report depends largely on the encouragement and guidelines of many others. We are especially grateful to our guide Prof S.G.Dhengre and Prof. D.P. Gaikwad , Head of Computer Engineering Department, AISSMSCOE who has provided guidance, expertise and encouragement. We are thankful to the staff of Computer Engineering Department for their cooperation and support .We would like to put forward our heartfelt acknowledgement to all our classmates, friends and all those who have directly or indirectly provided their over whelming support during this project work and the development of this report.

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