8th International Conference on Multidisciplinary Research
Osmania University Centre for International Program, Osmania University Campus, Hyderabad (India)
Conference World
6th-7th September 2019 www.conferenceworld.in
ISBN : 978-81-941721-5-4

Resource Augmentation in Mobile cloud computing by deliberating both Energy and Economy

P. Sirisha[1] , Dr. R. Raja Sekhar[2]

M.Tech[1] , CSE Dept[1], JNTUACEA[1], Anantapuramu[1], A.P, India[1]

Associate Professor[2], CSE Dept [2], JNTUACEA [2], Anantapuramu [2], A.P, India [2]

Abstract:

Cloud computing is a variety of service provider through the Internet. Mobile Cloud computing is a simply Cloud Computing in which some mobile devices included among them. As the mobile devices increasing in large number day by day, mobiles are advanced to support resource concentrated applications. The Centralized Broker-node is utilized to perform task scheduling among the mobiles for the Resources augmentations. While the Task scheduling model performs the offloaded tasks by optimizing energy results to task scheduling problems. In this journal, we extend the task scheduling model by using the multiple clouds while considering both the monetary cost and energy consumption. The mobiles users offload tasks to the cloud as they are insufficient of the adequate resources for the task execution. The tasks from the mobile devices can be assigned to the resources by the task assignment method as per the user request. The proposed model detect an optimal solution for the task scheduling problem by using the multiple clouds and also by reducing the both energy and cost.

Keywords: ***Cloud computing, Energy consumption, Mobile cloud computing, Multiple clouds, Task scheduling.***

I. Introduction:

Advancement in the new technologies of communication and hardware computing, mobile devices are permitted to hold up the resource concentrated applications. However, resources are constraints and inherent to their capacity and quantity, put limits to process and also the desired performance can be gained after a long time for long time, and their energy in terms of battery will reduces faster than the normal usage. In Resource Augmentation Environment (RAE), clients offload their tasks to clouds, when the resources with them are not efficient for the task execution and effective to gain the execution with desired performance (i.e. less time for execution and usage of energy in little amount). Task offloading includes the extra data communication, that increases the energy required for the completion of task at the remote location, and also increases the cost for usage of resources at the remote location and performing all the tasks on among all user devices. In the previous approach the communication is

reduced with the help resource monitoring. The approach also reduces the time with monitoring the resources of multiple service nodes. The main scheme of this paper is focusing on Mobile Cloud Computing. The mobile cloud computing is an appearing advanced research topic relevant to the Cloud Computing. The model in the earlier works focused on process of optimizing the energy. However, the proposed model extends the task scheduling model with extension of optimization process. Indeed, now decisions foe offloading of tasks can be done basing on consumption of energy or cost monetary and also sometime based on combination of the both. Thus, we developed an task scheduler model with the consideration of energy consumption and cost awareness for solving the task scheduling problem. This model extends the process of task scheduling by including energy and cost. The task scheduler model is developed with the aim of minimizing the cost and the energy among the number of user mobiles. We extends the process using the multiple cloud servers which results in reducing the task offloading problem and also by deliberating the both energy and cost.

II. Literature Survey:

1. **A.Matrawy and M. St-Hilaire**[1]

proposed a system which can reduces the energy usage in cyber foraging system among all the devices. They used scheduler that can process by a centralized broker node. The result shows that by utilizing a centralized broker-node, we can optimally offload tasks and can a notable reduce in energy consumption.

2. **Sokol Kosta and Anrius Aucina**[4]

had a framework that in which developers can easily drift their smart phones application for the cloud. Think Air extends the concept of virtualization among smart phones in the clouds and this can provide a method-level offloading computation. Advancing in work, it focused on the scalability and elasticity of the clouds and extends the energy of Mobile Cloud Computing by parallelizing execution methods with multiple virtual machines (VM).

3. **Karthik kumar and Yung Hasing lu**[6]

both of them explains about a era. The cloud exploits a new era of computing. In this type of computing applies services are benefited with the help of Internet. cloud computing can extends the capacity of computing for mobiles, but this is not the final solution for extending the systems batteries lifetime. We can get the final solution for the systems battery extensions.

4. **Antti P. Miettinen and J. Nurminen** [8]

provide an analytical view of the critical factors that affects the energy consumption of user clients in cloud computing. Further, we can have our own measurements for the central characters of modern mobiles controlled devices, and explains the basic balances between the local and remote computing.

5. **J.Flinn and M. Satyanarayanan[10]**

describe a Spectra, the spectra is a system of remote execution for clients with battery powered used in the extensive computing. Spectra enabled applications to join the mobility of small mobile devices with the greater powered processing of static compute servers. Spectra is self-tuning, it controls the using of application resources and the availability of resources in environment, and explains how and where the application components should be executed.

III. Manjinder Nir, & Ashraf Matrawy:

The earlier authors proposed that for managing the tasks Centralized broker-node is among more number of mobile devices. Mobile devices offload multiple tasks to the cloud and allocate resources as per their constraints. In the previous paper, task scheduling model is developed by considering the energy consumption in both the private cloud and the public cloud by using only single servers. As the devices offload task to the clouds in large number, the cloud may delay the process and also may not provide execution as per the user requirements, and also may charge more for the task offloading. The model can be improved by satisfying user constraints and performs desired execution.

IV. Proposed System:

As the increment in number of mobile devices offload multiple tasks to the clouds. We extend the Task Scheduling model by considering the energy consumption and monitoring cost using the multiple clouds in both resources augmentation environments (private cloud and public cloud). The extended model result the optimum solution for task scheduling problem by using the multiple clouds than the single cloud when the devices offload multiple task to the clouds. By using this method we can reduce the energy and also cost required for the task. The extended model can perform the task by reducing both the energy and cost. The clouds can efficiently complete all the with the desired output and also as per the user requirements

V. Task offloading:

The mobiles devices are connected with the clouds for offloading tasks. The centralized broker node performs the task scheduling. The cloud resources are allocated to the devices as per the requirements. The task scheduling model performs the task by reducing the energy and also with the desired execution. The devices are connected to the cloud with the centralized broker node and performs the as per the user constraints. The task scheduling model is developed by the aim of minimizing the energy consumption.

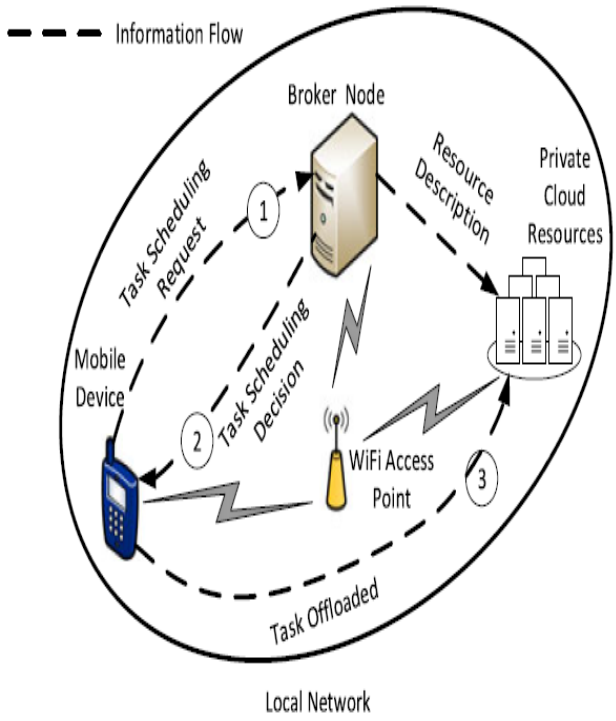


Fig 1: Task offloading in private cloud

The mobile devices are connected to the public clouds through the internet. The task offloading in the public clouds may charge for the task execution. The task scheduling model also reduces the cost for the task execution. The task scheduling model performs the task offloaded with minimization of energy consumption and also the cost for the task within the clouds. The task offloading in the public cloud through the internet is shown in the figure.

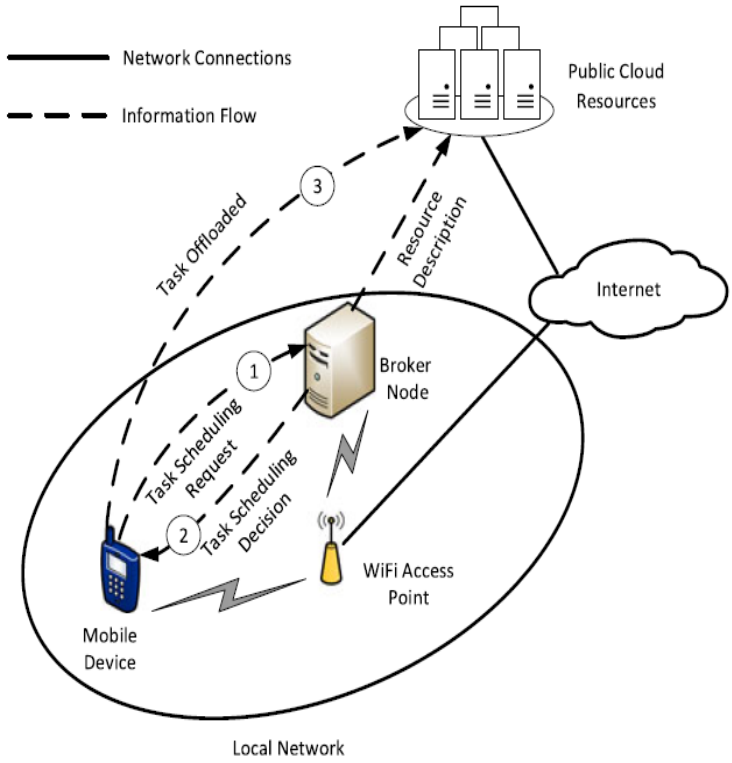


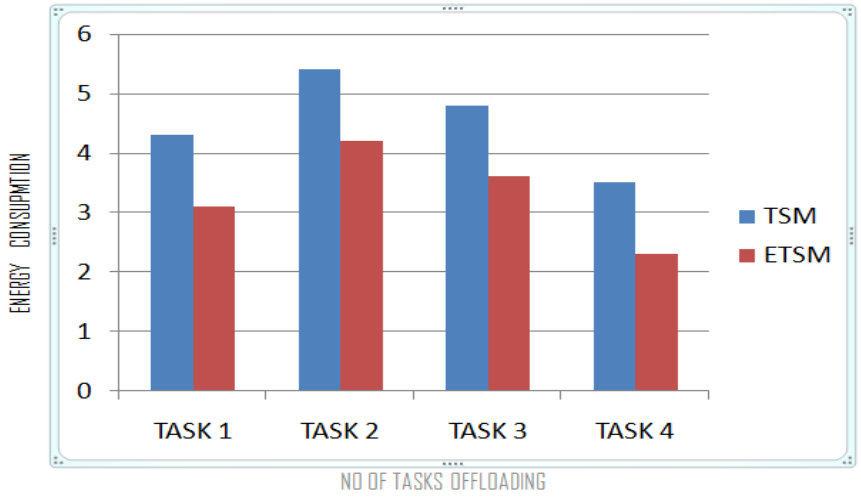
Fig 2: task offloading in public cloud

VI. Performance Analysis:

The mobile devices are increasing day by day in large number such that, all user need to perform their task effectively and efficiently. The mobile devices offload their task to the cloud. Centralized node is used to perform task scheduling. The developed task scheduling model performs all the offloaded tasks of mobile devices efficiently by reducing the energy and also by low cost.

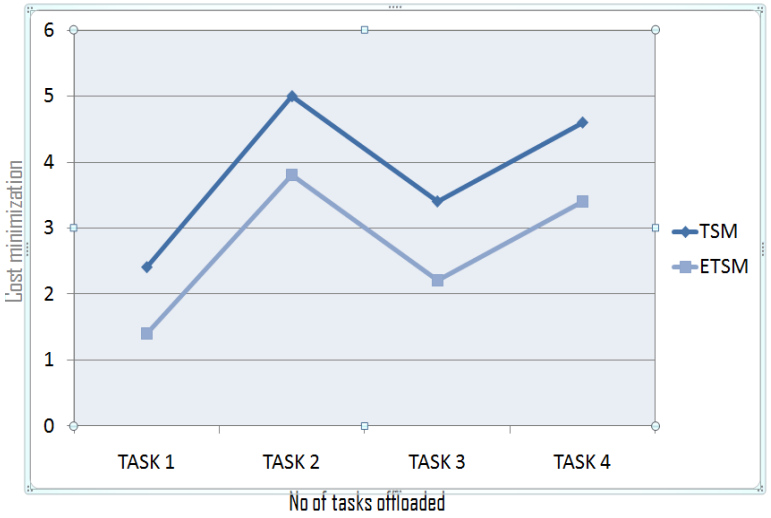
1. Energy consumption:

While the devices are connected to centralized broker node, the broker node performs the task scheduling process. The energy required for the task offloading by the cloud can be reduced by the extended scheduling model. The energy used for the task offloading can be minimized by the task scheduling model.



2. Reduction of Cost:

The mobile devices may charge for the task offloading over the internet. The extended task scheduling method reduces the cost for the task offloading. The optimization process cannot reduce the cost while connected to the clouds. We developed the task scheduling model with minimizing the cost and also performs tasks as per the requirements of the user



The extended task scheduling model reduces the cost and energy as shown. It can provide optimal solution for the scheduling problem.

VII CONCLUSION:

The mobile devices connect to the clouds to perform their tasks. The centralized- broker connects works as the mediator for both mobile devices and the clouds. The devices can perform their task through the clouds with the desired performance. The extended task scheduling model performs the tasks offloaded using the multiple clouds by reducing the energy required for the task and also the monitoring cost. By this the devices can offload multiple tasks with the desired constraints. The task scheduling model can performs in both (public cloud and private cloud) the resources augmentation environments. This is the optimal solution for task scheduling problem. As a future work the model can be extended by using the task priority, network blockage and task execution redundancy while the devices offload multiple tasks to the clouds

REFERENCES

[1] M. Nir, A. Matrawy, and M. St-Hilaire, "Optimizing energy consumption in broker-assisted cyber foraging systems," in Proc.IEEE 28th Int. Conf. Adv. Inf. Netw. Appl., 2014, pp. 576–583.

[2] M. Nir, A. Matrawy, and M. St-Hilaire, "An energy optimizing scheduler for mobile cloud computing environments," in Proc.

IEEE Conf. Comput. Commun. Workshops, 2014, pp. 404–409

.[3] Y. Wen, W. Zhang, and H. Luo, "Energy-optimal mobile application

execution: Taming resource-poor mobile devices with cloud clones," in Proc. IEEE INFOCOM, 2012, pp. 2716–2720.

[4] S. Kosta, A. Aucinas, P. Hui, R. Mortier, and X. Zhang, "ThinkAir: Dynamic resource allocation and parallel execution in the cloud

for mobile code offloading," in Proc. IEEE 31st Annu. Int. Conf. Comput. Commun. (INFOCOM), 2012, pp. 945–953.

[5] E. Cuervo, A. Balasubramanian, D. Cho, A. Wolman, S. Saroiu, R. Chandra, and P. Bahl, "Maui: Making smartphones last longer with code offload," in Proc. 8th Int. Conf. Mobile Syst. Appl. Serv., 2010, pp. 49–62.

[6] K. Kumar and Y.-H. Lu, "Cloud computing for mobile users: Can offloading computation save energy?" Computer, vol. 43, no. 4, pp. 51–56, Apr. 2010.

[7] R. Kemp, N. Palmer, T. Kielmann, F. Seinstra, N. Drost, J. Maassen, and H. Bal, "eyeDentify: Multimedia cyber foraging from a smartphone," in Proc. IEEE 11th Int. Symp. Multimedia, 2009, pp. 392–399.

[8] A. Miettinen and J. Nurminen, "Energy efficiency of mobile clients in cloud computing," in Proc. 2nd Conf. Hot Topics Cloud Comput., 2010, p. 4.

[9] M. Nir and A. Matrawy, "Centralized management of scalable cyber foraging systems," in Proc. 4th Int. Conf. Emerging Ubiquitous Syst. Pervasive Netw., 2013, vol. 21, pp. 265–273.

[10] J.Flinn, S. Park, and M. Satyanarayanan, "Balancing performance,
energy, and quality in pervasive computing," in Proc. 22nd Int. Conf. Distrib. Comput. Syst., 2002, pp. 217–226.

[11] B. Aggarwal, P. Chitnis, A. Dey, K. Jain, V. Navda, V. N. Padmanabhan, R. Ramjee, A. Schulman, and N. Spring, "Stratus: Energyefficient mobile communication using cloud support," ACM
SIGCOMM Comput. Commun. Rev., vol. 41, no. 4, pp. 477–478, 2011.

[12] R. Kemp, N. Palmer, T. Kielmann, and H. Bal, "Cuckoo: A computation offloading framework for smartphones," in Proc. 2nd Int. ICST Conf. Mobile Comput., Appl. Services, 2012, pp. 59–79.

[13] R. Balan, M. Satyanarayanan, S. Park, and T. Okoshi, "Tactics- Based remote execution for mobile computing," in Proc. 1st Int. Conf. Mobile Syst. Appl. Serv., 2003, pp. 273–286.

[14] M. Darø Kristensen, "Empowering mobile devices through cyber foraging," Ph.D. dissertation, Department of Computer Science, Aarhus University, Denmark, 2010.