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INTERMITTENTLY CONNECTED CLOUDLET SYSTEM TO OBTAIN AN OPTIMAL OFFLOADING POLICY

[1]Nadim Akhtar, [2]Dr. N.Srinivasan
Department of MCA (Prof. & Head of faculty of Computer Science & Application),
Sathyabama University, Chennai.
Email: nadimakhtar075@gmail.com

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Abstract

The great potential has been shown over the performance enhancement for offloading the mobile devices within intensive parts of computation within mobile cloud application. The complete realization for the potential which being mismatch within the particular mobile devices on the resource computing demand and that provide an offer. The request over offloading is connecting the variable network where cloud services are always being in the required process within infrequent, variable connectivity of network and quick response time for relatively incurring the times for long setup and quanta for long time are may be indifferent for the connectivity of network. The requirement over the mobile application is needed more resources for executing the single device task within the fact of mobile devices enhanced capabilities. The problems have been addressed for several computation of offloading the remote cloud services and resources which is locating the computing resources in the cloudlets. The proposed concept is proposing an experimental approach for highlighting the tradeoff of offloading. The proposed architecture of the generic algorithm is performing an integration of mobile cloud computing for automatic offloading to improve the application response time when minimizing the consumption of energy for mobile device. Offloading task within a remote machine is not better than performing task particularly. The particular performance of the task is always better than remote machine. The proposed system is developing an algorithm of optimal offloading for mobile user which considering over the cloudlets availability and local load of user's. The solution and formulation of the MDP (Markov Decision Process) model is for obtaining a policy to the user mobile and minimizing the objective of offloading cost and computation cost.

Keywords: Markov Decision Process (MDP), Offloading, Cloud Storage, Intermittent Connectivity.

Introduction

Nowadays, the Smartphones are growing and increasing popularity with a high rate and has an expectation to pass devices of computing [1]. The proliferation towards the outlooks is decelerating the end-user functionality towards proliferation within restrained resources and unreplenishable energy resources. The employment of cloud services in mobile technology is computing the MCC (Mobile Cloud Computing) which aims to obtain several visions such as storage extension, safety of data, energy conservation, and reduction of cost.

The opportunity abundance over cloud is expecting an enhancement of experience the computation nearly 250 million individual business for mobile users in some recent years for driving the revenue [2]. The upcoming generation of the wireless network is going to perform very crucial task for providing the opportunity of consistent connectivity of mobile computing, transmission of data-rate highly, jitter control and reducing delay [3]. The tablets and Smartphone are better example for portable device over the cloudlet communication in every schedule. The devices are performing a very crucial role over the process of storage and capability of cloud computing [4].

The energy consumption and services over cloudlets are still need to get improved within the generation of cloud services. The computation process within offloading is performing their task within cloud services supported devices. The success rate over the cloudlets still suffers within the shortcoming process and the flexibility of the services are including the work amid of remote cloud and mobile devices [7]. The proposed services are providing such advantage to perform the task efficiently within a rated technologies for processing the remote application over mobile by using cloudlets [5] and addressing the issue of latency.

The several concept has been presented the concept for addressing the latency issues within handling the intermittent connectivity over mobile devices. Therefore, an approach has been proposed in the proposed system to proceed by solving the issues within the resources of mobile computation [6].

The proposed technique MDP is completely based on the offloading algorithm within a cloudlet system, the application execution is dividing the services into several phases. The mobile user would be able to decide the execution of application within cloudlet storage over mobile devices. The MDP is providing the optimal solution for minimizing the communication and computation cost. The stochastic model of mobility been derived and described amid of the cloudlets and mobile within intermittent connection.

Related Work

Influencing cloud computing and mobile networking attracts more researchers nowadays [8]. For mobile computers along with dynamic partitioning and fixed infrastructure gives earliest solutions [10]. The number of offload framework sustains off loadable applications development. Through level services system achieve the Offloading. For offloading, software developer manually associate the code intercepts the service offloading. By generating proxy Cuckoo integrates [9] the Android applications. Proxy makes the decisions to invoke equivalent local method or migrates the calculation to surrogate. The method of offloading is using the annotations and wrapping directly to proxying. The proposed approach is not more intrusive for the developer's application is sensing the required concept to strict the separation for parts of offloading code [12]. The authors [11] have presented an approach for deciding for the execution of task over the service of remote cloud over the local cloud based for dynamic and static analysis to profiling information for a task. The CloneClone is presenting an enhanced virtual machine for implementing the platform for intercept the threads at the level of byte-code and for migration of distributed concurrency. The authors [14] have proposed several purposes for mobility routing within the scheme of 2-hop routing for improving the capacity of network.

The authors [13] have also proposed a concept over the mobility routing for solving the issues in intermittent communication for setting the challenged network within unpredictable mobility and low density of node. Several authors have proposed the mobility routing concept for encountering and future enhancement of the cloud mobility within a pattern of mobility [14].

Every individual nodes are following simple model of cloud mobility routing like random walk on theoretic tractability. The authors [16] have proposed a meeting constantly amid of mobile nodes for deriving the times for inter-meeting. Along a different line of research, to understand mobilityempirically, there has been WLAN measurement workswhich reveal the important mobility characteristics of thereal-world wireless network users [15]. Large-scaledeployments of WLANs in university and corporate campusesprovide an excellent platform in which hugeamount of userdata can be collected and analyzed[17].

Proposed Work

Overview: The proposed is presenting better overview of the Markov Decision Process (MDP) model for mobile user to get connected with the cloudlet for getting a policy over optimal offloading. The determined policy for execution the

action and optimal offloading on the basis of minimum cost and mobile user. The system of cloudlet is considering over every particular user of mobile for serving the multiple clouds of mobile.

Overall Architecture

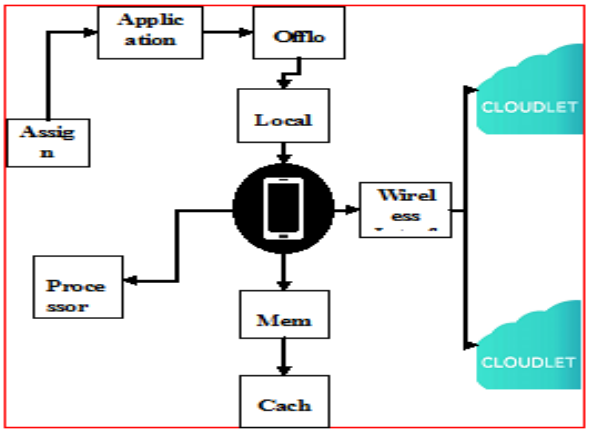

Figure 1: Overall Architecture

Proposed method and algorithm

Generate task process: he users have to generate task which has not executed in users system itself because no perform availability in task as results user sends the task towards gateway. The gateway is midway among cloudlets and user. Gateway has been supervised Cloudlets systems and user system mobility. After client created task then they send to gateway. Based on cloudlet coverage gateway selects cloudlets to perform task.

Gateway and Server Process: The gateway collects the task and allocate into the cloudlets that are Intermittent. Every availability cloudlets resources identify the gateway. The gateway allocate appropriate task to cloudlets based on user's task. Each cloudlets has own method to perform the task. All cloudlets output has been other cloudlets input.

Cloutlets Process: Each Cloudlets confirm the independency and dependency jars of every resource will execute. The Cloudlets first perform dependency resources afterwards only independency resources will perform. The input task use one of output task in dependency resource. Cloudlets execute first dependency resources then wait for other task output. Then all outputs returned back to user.

MDP Algorithm and Process: MDPs state-based formulation standard begin. We presume that domain interest could be represented as observable MDP by means of finite set of actions and states. Stochastic state transitions action induce denoting probability which circumstances is accomplished when action execution condition. We presume real-valued return function, connecting with every circumstance its instantaneous utility.

The stationary policy explains meticulous action course to adopt by agent by denoting action taken in circumstances. The decision trouble solved by agent in MDP is to optimal policy forming that make the most of expected total collected remuneration over the finite horizon. By adopting estimated total condensed remuneration as optimality criterion we compare the policies, in which prospect rewards are concession data rate and policy Value, mentioned by total discounted remuneration accrued.

Algorithm

Result and Discussion

Experimental Setup:

The above proposed technique is being implemented over the described system configuration with windows operating system, 512 MB RAM, 320 GB Hard Disk, Android v2.3 and Pentium IV and above.

Comparison Table

Table-1: Overall result comparison between proposed and existing system.

Technique	Efficiency	Quality
Proposed	92	93.2
Existing	90.92	89.79

The above mentioned table is presenting the comparison result amid of existing and proposed technique, where proposed technique MDP (Markov Decision Process) is producing better output in compare to existing technique.

Quality Performance

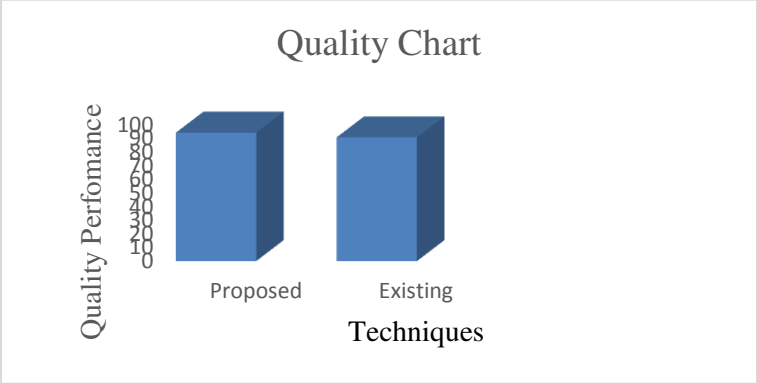

Figure 2: Quality Chart

The above mentioned figure 2 is presenting the existing and proposed quality performance, the simulated result of the proposed technique is producing better output in compare to existing.

Efficiency Performance

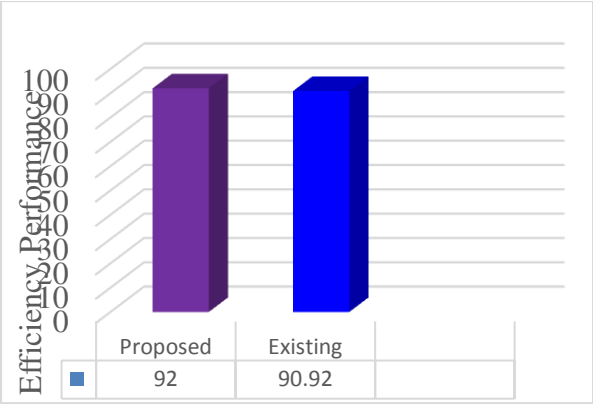

Figure 3: Efficiency Performance

The above mentioned figure 3 is presenting comparison amid of proposed and existing technique based on the efficiency, the proposed technique MDP is proposing better and accurate efficiency.

Conclusion and Enhancement

The proposed technique MDP (Markov Decision Process) is performing the operation in cloudlet system for performing the task of mobile devices. The cloudlet system is handling the local storage for mobile devices by offloading the storage space and providing space to the mobile devices to perform their task. The offloading process is being performed by MDP, the proposed technique is optimizing the iteration algorithm for the performance of analytical estimation within dynamic and static offloading process. The proposed scheme for dynamic offloading is assigning the task to cloudlet system for enhancing the performance for assigned task work done. The decision process is making the user to perform the task independently over the cloudlet.

References:

1. Gartner Lowers PC Forecast as Consumers Diversify Computing Needs Across Devices, Acceesible from: www.gartner.com/it/page. jsp?id= 1570714, 2011.

2. Mobile Cloud Application, ABI Research Report, Acceesible from: www.abiresearch.com/research/1003385.

3. I. F. AKYILDIZ, et al., A Survey of Mobility Management in Next-Generation All-IP-Based Wireless Systems, IEEE Wireless Communications, 2004.

4. N. Nasser, et al.,Handoffs in Fourth Generation Heterogeneous Networks, Communications Magazine, Vol.44, No.10, 2006, pp. 96-103.

5. B. Chun, S. Ihm, P. Maniatis, M. Naik, and A. Patti. Clonecloud: elastic execution between mobile device and cloud. In Proceedings of the 6th European Conference on Computer Systems (EuroSys'11), pages 301–314, 2011.
6. M. Satyanarayanan, P. Bahl, R. Caceres, and N. Davies. The case for VM-based cloudlets in mobile computing. IEEE Pervasive Computing, 2009.
7. E. Marinelli. Hyrax: Cloud computing on mobile devices using mapreduce. Master's thesis, Computer Science Dept., CMU, September 2009.
8. J. Flinn. Cyber foraging: Bridging mobile and cloud computing. Synthesis Lectures on Mobile and Pervasive Computing, 7(2):1–103, 2012.
9. R. Kemp, N. Palmer, T. Kielmann, and H. Bal. Cuckoo: A computation offloading framework for smartphones. pages 59–79. Springer Berlin Heidelberg, 2012.
10. A. Rudenko, P. Reiher, G. J. Popek, and G. H. Kuenning. Saving portable computer battery power through remote process execution. SIGMOBILE Mob. Comput. Commun. Rev., 2(1):19–26, Jan. 1998.
11. B.-G. Chun, S. Ihm, P. Maniatis, M. Naik, and A. Patti. Clonecloud: elastic execution between mobile device and cloud. In Proceedings of the sixth conference on Computer systems, EuroSys '11, pages 301–314, New York, NY, USA, 2011. ACM.
12. E. Cuervo, A. Balasubramanian, D. ki Cho, A. Wolman, S. Saroiu, R. Chandra, and P. Bahl. Maui: making smartphones last longer with code offload. In MobiSys'10, pages 49–62, 2010.
13. M. Grossglauser and D. Tse, "Mobility increases the capacity of ad hoc wireless networks," IEEE/ACM Transactions on Networking, 10(4), 2002.
14. M. Balazinska and P. Castro, "Characterizing Mobility and Network Usage in a Corporate Wireless Local-Area Network," In Proceedings of MOBISYS 2003, May 2003.
15. R. Groenevelt, P. Nain, and G. Koole, "The Message Delay in Mobile Ad Hoc Networks," In Proceedings of PERFORMANCE, Oct. 2005.
16. MobiLib: Community-wide Library of Mobility and Wireless Networks Measurements. http://nile.usc.edu/MobiLib.

Corresponding Author:
Nadim Akhtar*,
Email: *nadimakhtar075@gmail.com*