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A Distributed Computing Infrastructure Using Smart phone

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Abstract: In distributed computing infrastructure, even if specialized high performance server hardware might provide better performance per watt ratios, a classical server will consume more power when it is idle, it will also need more supporting infrastructure such as space, air conditioning ,and thus imposes a higher total cost of ownership(TCO) compared to mobile devices and to setup a new such infrastructure will indeed require a huge amount in terms of both economically and human resources. Every night, many smartphones are plugged into a power source for recharging the battery. Given the increasing computing capabilities of smartphones, these idle phones constitute a size able computing infrastructure. Therefore, for an enterprise which supplies its employees with smartphones, it is arguable that a computing infrastructure that leverages idle smartphones being charged overnight is an energy - efficient and cost-effective alternative to running certain tasks on traditional servers.

Key Terms: Smartphone, Infrastructure, Computing.

1. INTRODUCTION

The project framework is named as distributed Computing Infrastructure Using Smart phone. It uses a single server connected to the Internet, for scheduling jobs on the smartphones and collecting the outputs from the computations. The scheduling algorithms on the server are lightweight, and thus, a rudimentary low cost PC will suffice. Many of these challenges are addressed to develop a distributed computing infrastructure using smart phones. Through this method it is envisioned building a distributed computing infrastructure using smart phones for enterprises. The main vision is based on several compelling observations including (a) enterprises provide their employees with smart phones in many cases, (b) the phones are typically unused when being charged, and (c) such an infrastructure could potentially yield significant cost benefits to the enterprise.

The security issues are addressed through the encrypting the data which is sent from the server to client (Smartphone's) and back from client(smartphones) to server. Enterprise computing using smart phones. The system that is closest in spirit to computation while charging is CANDIS, where the authors proposed using employee smart phones being charged for executing enterprise applications. They implemented an execution environment for Android that allows for running desktop Java applications on smartphones in an automated fashion. They also made similar observations about scheduling tasks based on computational capabilities of Smartphones. While in CWC it is envisioned similar applications and system implementation. Bootstrapping cost of CANDIS is too high and it has high energy consumption. There is a possibility that sensitive enterprise data gets exposed when the server communicates with smart phones using residential WiFinetworks. Makespan of this approach is high which will increases the execution time and also the total collective time of the entire task at hand.

2. LITERATURE SURVEY

The three main components of CANDIS are developer, server and clients (smartphones), where the developer introduces the task written in java packed by .jar file including parameters, then the file is compiled to a palvik executable task .dex file a compiled android application code file, at server those tasks are distributed to clients and the task is executed and results are sent back to server and in turn to developer. The proposed system provides a better sophisticated algorithm that minimizes the makespan based on both CPU capabilities and between of smartphones, which has not been explicitly addressed in CANDIS. The migration of task when failure by a allocated device is addressed also the energy consumption is optimized compared to the CANDIS.[1]

From the fact that the smartphones limited battery capacity can be a reason to think about considering the inclusion of smartphones into distributed computing infrastructure, but by a large scale study to measure the energy consumption characteristics of 17300 blackberry smartphone users. Based on charging profile.The study has identified three types of users. Opportunistic charges, light-consumers and night time charges and finally reported on the energy consumption characteristics of each user type. The proliferation of smartphones is driving a near exponential growth in mobile applications. But these applications is governed by several constraints, of these constraints energy is the one resource that when depleted will render all of the applications on mobile devices including emergency and essential applications.

Opportunistic charges are the most common type of smartphone user. These users are primarily characterized by frequent, short charge durations during the hours of 8am to 5pm.Light consumers have the lowest energy discharge rate among all these types of users.These users allow their battery to drop to its lowest level before initiating a charge. In night time chargers a daily spike between 10pm to 11pm illustrates that these users initiate a charge before going to bed. The charging duration for this type of users is predominantly higher than that of other two groups, and such diverse usage of mobiles and charging can give a sophisticated long amount of idle stationary computing time to the infrastructure, and mobile as a node in computing infrastructure can yield to less power with high performance.[2]

Recent advancements in radio technology provide great flexibility and enhanced capabilities in executing wireless services. One of these capabilities that can provide significant advantages over traditional approaches is the concept of collaborative computing in wireless networks. With collaborative radio nodes, multiple independent radio nodes operate together to form a wireless distributed computing (WDC) network with significantly increased performance, operating efficiency, and abilities over a single node. WDC exploits wireless connectivity to share processing- intensive tasks among multiple devices. The goals are to reduce per-node and network resource requirements, and enable complex applications not otherwise possible, example image processing in a network of small form factor radio nodes. As discussed, WDC research aims to quantify the benefits of distributed processing over local processing, extend traditional distributed computing (DC) approaches to allow operation in dynamic radio environments, and meet design and implementation challenges unique to WDC with the help of recently available enabling technologies, such as software radios and cognitive radios.

Wireless distributed computing proposes that mobile devices can locally co-operate to execute processing – intensive tasks that would otherwise be limited by the resources of the single device. Example applications include local processing for time-critical data collection, real-time video and image sharing etc. Particularly energy efficiency, are achieved by applying WDC to a complex data processing task distributed across a collaborative network of radio nodes that possess computing capabilities. To achieve this, WDC research aims to extend traditional distributed computing (DC) approaches to allow operation in dynamic radio network environments, as well as meet challenges unique to WDC, with the help of recently available enabling technologies. WDC enables powerful computing and extend service execution capabilities with the help of a collaborative network of small form factor radio nodes that operate with reasonably low capacity batteries.[3]

Personal computing devices, such as smart-phones and PDAs, are commonplace, bundle several wireless network interfaces, can support compute intensive tasks, and are equipped with powerful means to produce multimedia content. Thus, they provide the resources for what it is envisioned as a human pervasive network: a network formed by user devices, suitable to convey to users rich multimedia content and services according to their interests and needs. Similar to opportunistic networks, where the communication is built on connectivity opportunities, In this envisage a network above these resources that joins together features of traditional pervasive networks and opportunistic networks fostering a new computing paradigm: opportunistic computing. In this Discussion the evolution from opportunistic networking to opportunistic computing; the survey key recent achievements in opportunistic networking, and describe the main concepts and challenges of opportunistic computing. Finally envision further possible scenarios and functionalities to make opportunistic computing a key player in the next-generation Internet.[4]

3. PROPOSED SYSTEM

In the proposed system the tasks in the server are executed by the typical means of running a task on smart phones today is running an application (app). When a user wants to execute a new task on her phone, she needs to download and install the app. This process requires human input for various reasons.To run tasks on the phones, a cross-platform mechanism is used with the Java Reflection API for Android. The.java source files are compiled into .class files at the central server, which are then packaged as.jar files using the Android tool chain . The.jar file together with the input data is copied to the phone. The phone extracts the.jar file, uses reflection to run the task, and produces the output.

The scheduling of the tasks is employed by a novel scheduling algorithm to minimize the makespan of a set of computing tasks.

Through this method it is envisioned building a distributed computing infrastructure using smart phones for enterprises. The main vision is based on several compelling observations including (a) enterprises provide their employees with smart phones in many cases, (b) the phones are typically unused when being charged, and (c) such an infrastructure could potentially yield significant cost benefits to the enterprise. Security of the data upon outsourcing is one of the critical issue and is addressed through the encrypting the data being sent.

Objectives: Profiling charging behaviors, where typically users charge on average 8 to 10 hours on night which provides sufficient amount of idle period for computing.

- Scheduling tasks on Smartphone's with efficient algorithm to minimizes the completion time(makespan) of the jobs.
- To efficiently migrate tasks to other phones that are plugged in when the task allocated phone ceases to charge.

- ➢ Automation of task executions, without involving the owner of the smartphones to perform the task.
- ➢ Securing the enterprise data by encryption

4. SYSTEM ARCHITECTURE

Project can be implemented in the systems which are connected to the mobile app services were implemented following model view controller pattern. XML is used to deploy the services. All storage is provided is using MYSQL .All the services for encryption is done on the windows XP .The client applications are mobile app such as Android 4.0 and above enabled phones.

5. CONCLUSION

The Proposed system works well to develop an mobile infrastructure system. The smart phones can be optimally utilized during an ideal time. However issues like hetorginity, energy constraints have to be improved. We have to thing also towards how mobile infrastructure can be used in enterprise level . When huge volume of data need to be process then the proposed system still need an advancement of advance processing system in hand held device

REFERENCES

[1] S. Schildt, F. B¨usching, E. J¨orns, and L. Wolf. CANDIS: Heterogeneous Mobile Cloud Framework and Energy Cost-Aware Scheduling. In IEEE GreenComiThings/CPSCom,June2013.

[2] Diversity in smartphone energy consumption. Oliver Earl 2010 Proceedings of the 2010 ACM workshop on Wireless of the students, by the students, for the students - S3 '10.

[3] Wireless distributed computing: a survey of research challenges Datla Dinesh Chen XuetaoTsouThomasRaghunandanSahanaHasanS.M.ReedJeffreyDietrichCarlBoseTamalFetteBruceKimJeong-Ho 2012 IEEE Commun. Mag.,IEEE Communications Magazine.IEEE , vol.50, no.1, pp.144-152, January 2012.

[4] From opportunistic networks to opportunistic computing,. Conti, M.; Giordano, S.; May, M.; Passarella, A., in Communications Magazine, IEEE , vol.48, no.9, pp.126-139, Sept. 2010.

[5] REPC: Reliable and efficient participatory computing for mobile devices,Zheng Dong; Linghe Kong; Peng Cheng; Liang He; Yu Gu; Lu Fang; Ting Zhu; Cong Liu, in Sensing, Communication, and Networking (SECON), 2014 Eleventh Annual IEEE International Conference on , vol., no., pp.257-265, June 30 2014-July 3 2014.

[6] Droid Cluster: Towards Smartphone Cluster Computing -- The Streets are Paved with Potential Computer Clusters,Busching, F.; Schildt, S.; Wolf, L., in Distributed Computing Systems Workshops (ICDCSW), 2012 32nd International Conference on , vol., no., pp.114-117, 18-21 June 2012.

[7] Supercomputing with commodity CPUs: Are mobile SoCs ready for HPC?,Rajovic, N.; Carpenter, P.M.; Gelado, I.; Puzovic, N.; Ramirez, A.; Valero, M.,in High Performance Computing, Networking, Storage and Analysis (SC), 2013 International Conference for , vol., no., pp.1-12, 17-22 Nov. 2013.

[8] A case for micro-cellstoresHarizopoulosStavrosPapadimitriou Spiros 2011 Proceedings of the Seventh International Workshop on Data Management on New Hardware - DaMoN '11.

[9] Task allocation and scheduling in wireless distributed computing networks Analog Integrated Circuits and Signal Processing, 2011, Volume 69, Number 2-3, Page 341 Dinesh Datla, Haris I. Volos, S. M. Hasan, Jeffrey H. Reed, Tamal Bose.