Job Allocation Mechanism for Battery Consumption Minimization of Cyber-Physical-Social Big Data Processing based on Mobile Cloud Computing

Abstract—The rapid development of ICT has led to the wide popularity of mobile devices, which have helped improve business efficiency and enabled simple mobility as small and light devices and convenience of being available anytime, anywhere for cyber-physical-social big data. There are many ongoing studies on mobile cloud computing (MCC) to overcome the limited computing capability and storage capacity and internal battery limitation by taking advantage of the popularity of mobile devices for the processing cyber-physical-social big data. MCC consists of service-oriented architecture, agent-client architecture, and collaborative architecture, with job splitting and allocation as the critical factor. As such, job allocation techniques considering the performance resources of mobile devices have been studied. Note, however, that there is a problem of job reallocation due to continuous battery consumption since the studies consider only the performance resources of mobile devices at the time of job allocation or take into account the performance resources and remaining battery power only. This paper proposes the job allocation mechanism (JAM) for battery consumption minimization of cyber-physical-social big data processing in MCC, which continuously reflects the battery consumption rate to process jobs with mobile devices only without an external cloud server in a collaborative architecture-based MCC environment. JAM allocates jobs considering the periodic measurement of battery consumption and surplus resource to minimize the problem of job reallocation due to battery rundown of the mobile devices. This research designs and implements a system for verifying JAM and demonstrated that the job processing speed increased in an MCC environment for cyber-physical-social big data.

CONCLUSION

In this paper, we proposed the Job Allocation Mechanism(JAM) for battery consumption minimization for processing cyber-physical-social big data in MCC, which continuously reflected the battery consumption rate to process jobs with mobile devices only without an external cloud server in a collaborative architecture-based MCC environment. Designed and implemented for verification, JAM allocated jobs considering the performance data and battery consumption rate of mobile devices. The performance evaluation showed that JAM improved the job processing speed compared to the allocation that did not consider the battery consumption rate.

In the future, we intend to research the building of adaptive cloud infrastructure that considers the desktop environment and mobile environment. Moreover, we plan to study the standardized communication data for resource interaction under a heterogeneous IoT environment.

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb

SOFTWARE REQUIREMENTS:

- Operating system : Windows 7/UBUNTU.

- Coding Language : Java 1.7 ,Hadoop 0.8.1
- IDE : Eclipse
- Database : MYSQL

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