

Synergy between mobile terminal and cloud computing.

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The role of cloud computing, as a new area of computing, is growing intensively. Mobile computer technology has also greatly evolved in the recent years. The application variety that can be used in mobile terminals is emerging, putting strong requirements both on software and hardware side of the mobile terminal. In cloud computing application services are provided through the Internet. Distributed and cloud computing is recognized to be a new area for solving performance issues. Mobile terminal can take advantage from cloud computing. To cope with these new resources and fulfill new quality and performance requirements a more sophisticated architecture and resource management is necessary. The basis of effective resource management is a precise knowledge of the hardware and software capabilities; currently available performance metrics must be adapted for mobile terminals. Performance and resource utilization of the mobile terminal must be identified. Performance metrics serve as an input for resource management, deciding which application where to run, on the mobile terminal, or in the cloud.

Mobile terminal can use cloud for solving performance issues, and to obtain richer user experience. The aim of the study is to present architecture of mobile resource management, that can utilize benefits of cloud computing. Performance measurement and usable metrics are mandatory for our later research: decision making mechanism implementation. The goal of the mechanism is to decide where the optimal place to run for a certain service/application is. On the mobile terminal itself, or on other nearby mobile terminal, or on public cloud computing server. Hence a performance and usage of the mobile terminal should be determined.

Emerging complexity of the application used in mobile terminals implicate harnessing of these extra performance resources. Applications with distributed components differ from traditional non distributed applications in numerous attributes, such as communication type and overhead, latency, concurrency etc. The task of proposed mobile terminal resource and service management is to decide which application and service where to execute. To effectively fulfill this complex task; sophisticated and dedicated decision formula is needed. As such a formula amplifies adapted and dedicated software and performance metrics. Mobile terminal coupled with distributed system can be dynamic, changing over time, resulting CPU and network load changing. Therefore mobile terminal as a part of the distributed hierarchy needs to have metrics very different than traditional software and performance metrics [1].

With mobile computer technology progress, the software and hardware platform becomes more and more complex, together with the amount of the tasks meant to be processed. Mobile terminal has some special features in comparison with traditional computing; small size, dependence on limited battery lifetime, computing power is changing, possible presence of 3D hardware, network bandwidth is limited [2], and almost exclusively wireless, relatively small display size, the user input is special one.

Usually same or similar applications are used in mobile terminals as in traditional computers so similar user experience is expected. Therefore, with comparably less performance nearly the same look and feel is required. Thus, the capabilities of the mobile hardware should be efficiently harnessed with smart resource management and load balancing.

References

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