

## A SCALABLE SERVER ARCHITECTURE FOR MOBILE PRESENCE SERVICE IN SOCIAL NETWORK APPLICATIONS

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### ABSTRACT

Social network applications are becoming increasingly popular on mobile devices. A mobile presence service is an essential component of a social network application because it maintains each mobile user's presence information, such as the current status (online/offline), GPS location and network address, and also updates the user's online friends with the information continually. If presence updates occur frequently, the enormous number of messages distributed by presence servers may lead to a scalability problem in a large-scale mobile presence service. To address the problem, we propose an efficient and scalable server architecture, called PresenceCloud, which enables mobile presence services to support large-scale social network applications. When a mobile user joins a network, PresenceCloud searches for the presence of his/her friends and notifies them of his/her arrival. PresenceCloud organizes presence servers into a quorum-based server-to-server architecture for efficient presence searching. It also leverages a directed search algorithm and a one-hop caching strategy to achieve small constant search latency. We analyze the performance of PresenceCloud in terms of the search cost and search satisfaction level. The search cost is defined as the total number of messages generated by the presence server when a user arrives; and search satisfaction level is defined as the time it takes to search for the arriving user's friend list. The results of simulations demonstrate that PresenceCloud achieves performance gains in the search cost without compromising search satisfaction.

**KEYWORDS:** Social Networks, Mobile Presence Services, Distributed Presence Servers, Cloud Computing