HCFA: Hybrid Coupled Flat Architecture for QoS Enhancement of Multimedia Applications in Mobile WiMAX Broadband Access Network

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Abstract

Worldwide Interoperability for Microwave Access (WiMAX) is the fourth generation (4G) core technology based on the IEEE 802.16 family. The challenge in the coming years for mobile networks will be to offer high bitrates data services to customers in mobility. Future mobile architectures are being standardized to offer mobility between heterogeneous access technologies. The design of these architectures does not take into account the scalability requirement since they are centralized with many network levels and dependency. Existing and future generations of wireless technologies are competition for providing seamless computing solutions using mobility management. To perform fast and seamless handovers for efficient data transfer there is a need for good mobility and session management framework. The high latency and high cost are the major drawback of a centralized high speed 3G/4G network. On the other hand, flat architecture of 3G/4G does not support high speed mobility even though it provides less latency. This paper proposes a novel architectural design using the entity, namely adaptive convergence router (ACR) for both low latency and seamless mobility which is introduced in the existing WiMAX flat architecture. It stores information and simultaneously
checks for resource availability and handoff control for every second and maintains the database, and adaptively controls the session handoff with better QoS. The mobile station sends resource request message to the ACR and it grants recourses according to the available bandwidth. So according to the proposed novel architecture, users can share three simultaneous paths according to their needs. The real time users can use centralized path, non real time users can share flat architecture path and combined hybrid path can be used for multimedia users. This mechanism provides load sharing and reduces the congestion so that less latency with seamless mobility can be achieved. The performance of the proposed architecture is evaluated through simulation by using OPNET modeler considering the metrics like throughput and delay.

**References**


Index Terms

Computer Science	Information Sciences

Keywords

MWiMAX, mobility, scalability, flat architecture, QoS