

MOBILE HANDOVER PROTOCOL FOR UMTS NETWORKS: A NEW APPROACH

Md. Abdur Razzaque¹

Md. Mahbub Alam²

Abstract

This paper deals with the mobile handover protocol in the Universal Mobile Telecommunication System (UMTS) in context of 3rd generation mobile communication system. A handover protocol for mobility management in between Satellite UMTS (S-UMTS) and Terrestrial UMTS (T-UMTS) networks has been proposed. The UMTS system architecture and some functional requirements are discussed, first. Then the proposed protocol has been introduced and explained with information flow diagrams for certain cases of internetwork handover. Further key functions required to perform efficient handover is discussed. The proposed protocol decreases the handover blocking probability by allowing T-UMTS Mobile Terminals (MT) to use S-UMTS network as a backup and thereby ensures smooth handover.

1. Introduction

Universal Mobile Telecommunication System (UMTS), is the European vision of a 3rd-generation communication system, which is currently under development. It is to be designed to continue the global success of the European 2nd generation mobile communication system, GSM (Global System for Mobile Communication). UMTS seeks to unify existing cellular, cordless and paging networks, and with the migration of mobile and fixed networks into one global universal communication system. UMTS will deliver low-cost, high-capacity mobile communications offering data rates up to 2Mbps with global roaming and other advanced capabilities [1][2]. To satisfy the predicted traffic demands with efficient use of radio resources and to support the concept of global coverage, mixed cell architecture has been defined in the UMTS standards [3] as shown in figure 1. The cells namely, pico, micro and macro, overlap and mobile satellites overlapping the terrestrial cells. Mobile Satellites provides the most effective coverage method to sparsely populated rural areas and they are planned to act as umbrella cells. In fact, umbrella cells will act as backup cells to macro cells that cover suburban areas.

The maximum data rate and the maximum speed of the user are different in each hierarchical layer. In the macro layer a data rate of 144kbps with maximum speed of 500 km/h

1 Lecturer, CIT Department, Islamic University of Technology (IUT)

2 Lecturer, IT Department, Australasia Institute of Business and Technology (AIBT)