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التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

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بالرسالة صفحات

لم ترد بالأصل

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Stratospheric Platforms for Wireless Communications

A thesis Submitted in Partial Fulfillment for the Degree of
Master of Science

By

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ABSTRACT

A quality-of-service-oriented medium access control "MAC" protocol is proposed for delivering multimedia services through a stratospheric aeronautical platform wireless communication system. The invented protocol exploits the statistical multiplexing of asynchronous transfer mode "ATM" technology. Combing the reservation- and contention-based access schemes in a single protocol allows the platform communication system at an altitude between 18-24 km to guarantee the service quality requirements for the diverse services. Exploiting the flexibility of the protocol as well as the low encountered propagation delay of the wireless link permit constant bit rate "CBR", variable bit rate "VBR" and available bit rate "ABR" services to be efficiently multiplexed without violating quality constraints. The effects of channel capacity and its associated limitations on the network performance are discussed and pragmatic solutions are suggested. Different service priority schemes such as first-input-first-output "FIFO" and first-dropped-first-output "FDFO" are presented and numerical results are discussed. The obtained results dictate the wireless ATM "WATM" multimedia communication via stratospheric platforms as a promising means for the next-generation wireless communication systems.

The provision of wireless services to the Egyptian territory is proposed using a network of high altitude platforms "HAPs". The platforms are interconnected with optical interplatform links in order to provide all wireless communication system. The connection is directed from the source to the overlaying platform and routed from one platform to the other until the one that is analogous to the destination. Each platform serves a certain area that is divided into cells, with each cell being covered by one beam of the antenna array onboard the platform. The system has the promise to swiftly provide wireless communication service anywhere in the territory at a minimal cost that is cheaper and more robust than the wired counterpart.

CONTENTS