

## Indirect RSVP for Virtual Cluster Cellular Mobile IP Networks

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**Abstract.** Mobile IP (MIP) could be deployed in a wireless cellular network so that an integrated Cellular Mobile IP (CMIP) network can be used to support the delivery of datagrams to mobile users. In order to provide QoS for realtime traffic in an IP-based network, Resource reSerVation Protocol (RSVP) is needed to reserve network resources along the route on which the datagrams flow. However, in its current form RSVP fails to operate through the MIP tunnel. Moreover, the high registration rate in a CMIP network greatly degrades RSVP performance. In this paper, an Indirect RSVP (IRSV) scheme for operation over a Virtual Cluster Cellular Mobile IP (VCCMIP) network is proposed. This scheme employs an assistant RSVP connection to assist with the end-to-end major RSVP operation over the MIP tunnel. The IRSVP signaling costs and packet loss rates are evaluated. Simulation results show that the proposed scheme can greatly increase RSVP performance in terms of packet loss rate and RSVP connection activity factor.

**Keywords.** RSVP, Mobile IP, IP QoS, IntServ, Cellular IP

## 1 Introduction

The importance of Internet to present day society hardly needs reiteration. A hybrid wireless/IP-based network offers an information transport platform for the support of user roaming on a global basis. However, end-to-end delivery of realtime traffic over the hybrid network presents a number of challenging problems. In a hybrid wireless/IP-based network, connection establishment and provision for continuous communications between mobile hosts across the Internet requires unique identification of the Internet Protocol (IP) addresses before any actual communication can begin. However, in an environment where the mobile hosts constantly change their access points, an interworking infrastructure and a networking protocol are needed to support mobility without disrupting any ongoing communication. The current suite of Internet protocols, i.e., TCP/IP, fall short of mobility support since