

# ABSTRACT

Nowadays, mobile devices support a variety of multimedia applications such as live video, radio or online gaming. People spend their time on mobile devices for entertainment more and more via the internet. Due to the requirements of multimedia applications over wireless communication those applications require a huge bandwidth on the network to support them, which creates problems for the network provider. However, one pattern that is appropriate for the efficient delivery of multimedia messages is multicast delivery.

Multicast services do, however, introduce challenges within the network when the recipients of the service are moving. Powerful multicast routing protocols are designed for static client IP addresses. Hence, when the mobile node changes the location, it introduces the problem of access network handover. Therefore, this is the aim of the research where a new framework will be developed for multicast mobility within WiFi network to reduce and provide smooth mobility when handover occurs. This research is focused on techniques to reduce handover latency, minimize packet loss and provide connection when a user moves between network zones.

To achieve these aims, this designed framework lets mobile nodes send the message to register to foreign agents in advance for addressing IP address of the new zone and to establish the multicast tree earlier. Moreover, there are processes that keep the connection of the path alive.

The framework is being simulated on OPNET Modeler for evaluating the performance in terms of handover latency time, the number of packet loss and so on. There are many scenarios that have been tested. According to the results, it shows that the new framework has reduced handover latency time around 60% on average and minimized packet delay approximately 0.7 - 150 ms on mobile node depending on network topology. This framework can provide IP address reconfiguration, binding update, joining multicast group and distribution path of multicast tree in advance. However, there are some overheads and cost that this framework has to pay for such as IP address database, increasing broadcast within networks and keeping connection path alive.