

**Network Controlled Vertical Handover
for
Heterogeneous Network**

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Certificate of Originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

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Abstract

Future wireless networks are expected to be a convergence of different wireless networks based on single Radio Access Technology. The aim is to provide seamless services to users anytime from anywhere in the world using proper devices.

In order to achieve this goal, seamless transition from one network to another with acceptable quality of service is required. Handover from one network to another is known as inter network or vertical handover.

Currently known Mobile Controlled Vertical Handover schemes have some limitations. Mobile Station is limited with power and has very limited information about networks. Due to these limitations, Mobile Controlled Vertical Handover (MCVHO) can not achieve high performance in terms of handover delay and handover decision.

In this thesis, a new Network Controlled Vertical Handover (NCVHO) scheme is proposed. Proposed NCVHO scheme uses information which is available only to network along with information available to mobile node to enhance handover decision and reduce total number of handover and call dropping.

NCVHO scheme also reduces the signaling on the wireless part of the network which reduces the usage of air interface. The scheme allows Point of Attachment (PoA) to make handover decision on behalf of mobile node which reduces signaling on the wireless part of the network. This change in a vertical handover scheme reduces signaling delay of the handover and achieves better handover delay performance.

NCVHO scheme is reduces signaling on the air interface and uses more information to make handover decision which can achieve higher performance for number of handovers and call dropping than MCVHO. The price is paid as increased processing delay at the Point of Attachment (PoA). Simulation in this thesis shows that NCVHO performance decreases at higher number of users in comparison with MCVHO.

A solution to this problem is also proposed in this thesis with some modification to NCVHO scheme, a new network controlled vertical handover scheme called distributed Network Controlled Vertical Handover (distNCVHO) is proposed. The scheme achieves better performance than NCVHO scheme in terms of handover delay, number of handovers and call dropping.

It is noticed in this thesis that more information available from the network can enhance handover decision which can in turn reduce total number of handovers with a large margin. Information such as network load, network properties such as coverage, available bandwidth can play a vital role in the handover decision making. Reduced usage of air interface can allow network to perform handover faster and reduce number of total handover attempts.