ABSTRACT

Next Generation wireless networks promise its users anywhere, anytime, any type connectivity. For mobile users with multi-homed wireless devices, the accessibility of various wireless networks alters with time and location. Change in the accessibility of a wireless network demands selection of a new network dynamically as part of Mobility Management for continuity of ongoing services. Performance is the fundamental measure to be taken care off during vertical handoff. In user centric approach, cost is another dominating measure with no less influence to performance. Few of the metrics that normally influence the decision process are: cost, bandwidth, link quality, latency, network coverage, and security etc. The singular objective of this thesis is to render user centric vertical handoff decision strategies which maximize user satisfaction, by finding optimal network for handoff with equilibrium between QoS and Cost parameter, by allowing the user to participate in the handoff decision process i.e. to become purely user centric and by being able to work with sophisticated environments. In this thesis, the entire problem has been studied systematically by breaking its ligaments into independently addressable sub-problems. The thesis also facilitates for related work covering various vertical handoff decision strategies highlighting their pros and cons. A synthesis of various vertical handoff decision strategies against numerous parameters is also included. The work presented in this thesis proposes four different vertical handoff decision strategies, all of which are studied for a file downloading application. Various concepts such as Multi Criterion Decision Making, Consumer Surplus Value, and Simple Exponential Smoothing for forecasting were studied and applied in pursuit of designing effective user centric vertical handoff decision strategies. All the strategies were thoroughly studied, simulated and examined for different test case scenarios. The significance of the research rests in the simple fact that maximizing user satisfaction is fundamental for the success and growth of next generation communications industry.

Keywords: Heterogeneous Wireless Networks, Handoff, Vertical Handoff, Network Ranking, Consumer Surplus Value, Network Performance Prediction, Intelligent handoff