

PhD Oral Defense

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Thesis Title

A Study of Network Neutrality and Differentiated Services



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Abstract

During the last two decades we have witnessed a continuous debate on whether net neutrality policies should be adopted to maintain the openness of the Internet. This debate has led the U.S. Federal Communications Commission to adjust its Internet regulation policies several times in the U.S., while there is still lack of understanding of net neutrality related issue among the public.

This multi-disciplinary study aims to provide useful information for analyzing and understanding the network neutrality debate. It begins with a comprehensive literature study on net neutrality from three perspectives: policy, economic and engineering. This thesis uses queuing models to comparatively study the tradeoffs between the economic cost of ISPs, and the delay of end-users. In addition, we differentiate data packets by their transmission protocols to examine the quality of services perceived by users. We test this approach by using real datasets.

Alongside the performance analysis, we also conducted a public opinion survey on network regulation policies in Hong Kong. We emphasize two of the key issues about net neutrality, namely zero-rating and differentiated prioritized services in Internet access. Since the concept of net neutrality is rather elusive and complex, we use novel 2×2 factorial vignettes to illustrate the network regulation policies to be implemented in Hong Kong. The polling data show that most of the respondents acknowledged the importance of the network neutrality policy for Hong Kong while also accepting both zero-rating and differentiated service.