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**Sujet de Thèse :**

**Contrôle de la Mobilité, Analyse et Amélioration de la QoS/QoE dans un Environnement Mobile : cas des réseaux sans fil ad hoc**

**Abstract :**

In this era where customer needs are ever-evolving, high performance alone seems to no longer be the sole criterion for establishing quality standards. Business management is therefore compelled to reach for further than its objective performance. As ever, the customer is king - the pivot & centerpiece to any solid marketing strategy; whence the necessity of defining new terms of quality that address the subjective facet of services. The master disciplines defined, thus, are: Customer Experience (CE) and the Quality of Experience (QoE).

Wireless networks have become a quasi-integral part of modern life; an infrastructure that is vital both to social and professional life. And yet, the continual enhancement &/or updating of the Quality of Service (QoS)/Quality of Experience (QoE) on such networks, notably for sensitive transmission, remains a particularly challenging matter within the networking research community. In MANETs, the free mobility of Mobile Nodes (MNs) (i.e. their real-time physical location change, and intra-network movement), renders network topology often subject to unpredictable fluctuations. Furthermore, routing protocols are methodically geared toward objective quality (QoS), while the subjective aspect is not taken into consideration as a criterion for performance evaluation.

In this vein, the thesis herein aims to analyze & enhance the performance of routing protocols in MANETs for one of the most popular web services: Video Streaming.

We shall first focus on the dynamic behavior of MANETs, which is closely tied to its signature inter-MN link status change. To that effect, we shall propose a mobility metric well-suited to accounting for the complex scenario of Network Mobility. Secondly, we shall address details regarding the complexity of evaluating & comparing the performance of routing protocols in MANETs; whereupon we introduce a new mobility condition, one defined independently of the chosen mobility model, as a more fluid tool of performance analysis.

It is no secret that QA (quality assurance) within the MANET environment, be it objective or subjective, is a challenge to be reckoned with. In fact, the extant routing protocols are generally network-oriented and remain, as such, chiefly dependent upon objective quality parameters, whence they seldom correlate with the more prioritized QoE standards. In that regard, this thesis shall present an empirical case study on video transmission through ad hoc networks, using two distinct routing protocols in view of identifying the one most optimal in terms of subjective quality returns (QoE). The first segment shall compare & contrast a proactive protocol (AODV) to a reactive-type one (OLSR); while the second part shall compare the original version of OLSR to a custom heuristic variant with an independently defined mobility condition. As for QoE prediction, we shall estimate the mean opinion scores (MOS) as an anticipated measure of the end-user's appraisal.

**Keywords:** Ad-hoc networks, Mobility, Video Streaming, Routing protocols, Quality of Experience.