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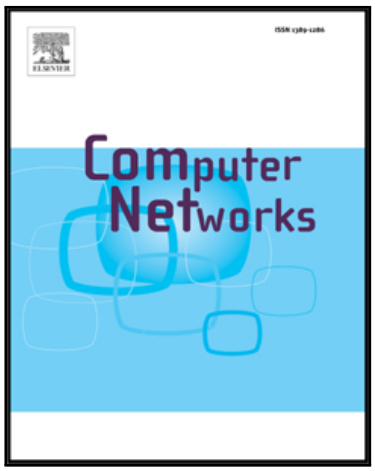

Vehicular Cloud Computing: Architectures, Applications, and Mobility

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Vehicular Cloud Computing: Architectures, Applications, and Mobility

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Abstract

Intelligent transportation systems are designed to provide innovative applications and services relating to traffic management, as well as to facilitate the access to information for other systems and users. The compelling motivation for employing underutilized onboard resources for transportation systems and the advancements in management technology for Cloud computing resources has promoted the concept of Vehicular Clouds. This work gathers and describes the most recent approaches and solutions for Vehicular Clouds, featuring applications, services, and traffic models that can enable Vehicular Cloud in a more dynamic environment. We have considered a large number of applications and services that showed relevance in the scope of the transportation system, benefiting its management, drivers, passengers, and pedestrians. Nevertheless, the high traffic mobility imposes as a significant challenge in implementing a Vehicular Cloud on continually changing physical resources. The dynamics of the environment bring fundamental issues and increase the complexity of building this new type of Cloud. By analyzing the existing traffic models, we found that Vehicular Cloud computing is technologically feasible not just in the static environment, like a parking lot or garage where vehicles are stationary, but also the dynamic scenarios, such as highways or streets where vehicles move.

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