Machine-to-machine communications infrastructure for smart electric vehicle charging in private parking lots

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Abstract— The great concern about climate change and fossil fuel dependency is strongly encouraging the development and use of electric vehicles. However, the wide adoption of such vehicles is not possible without the deployment of charging infrastructures capable of integrating them into current and future electricity grids. There are many on-going research efforts and even products that propose different solutions to this problem. Standing out among them is the Spanish research project DOMOCELL, which aims at designing and developing a smart charging infrastructure for private parking lots. In this paper, we present its communications architecture, designed under the guidelines of efficiency, reliability, and scalability. In addition, we describe, supported by some practical use cases and emulations, how user authentication and authorization, as well as accounting and billing of power consumption, are performed even in roaming scenarios.

Index Terms— authentication, authorization, and accounting; charging infrastructure; communications architecture; electric vehicle; machine-to-machine; smart grid

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Citation:
López, G.; Custodio, V.; Herrera, F.J.; Moreno, J.I. "Machine-to-machine communications infrastructure for smart electric vehicle charging in private parking lots", International Journal of Communication Systems, vol.27, no.4, pp.643-660. April, 2014.