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A literature review of IoT energy platforms aimed at end users

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Abstract-

The rising interest in connecting everything to the Internet has not gone unnoticed in the energy sector. New actors that aim to remotely monitor and control home devices such as heating, ventilation and air conditioning (HVAC), light bulbs, or distributed energy resources (e.g., batteries, PV panels...) have come into play. However, transitioning from isolated often not interoperable home automation systems to open, yet secure, solutions that integrate external sources of information and cloud computing to make a more efficient use of energy, is not trivial. It requires designing and implementing hierarchical architectures and standard solutions to facilitate interoperability, one of the challenges of cross-domain smart-city applications as no standard solution has been established yet. Even though most solutions share a set of building blocks that have fostered the appearance of Internet of Things (IoT) middlewares to accelerate development, most existing energy platforms are still tailor-made for specific applications. This paper targets three audiences. First, for those interested in using or selecting an energy platform, the study carries out a comparative analysis of some of the most popular alternatives. Second, for those that are considering building new energy platforms, this paper analyzes the necessary hierarchical blocks, and the main design options and strategies. Finally, for those interested in comparing platforms, a new set of IoT levels that evaluate the adoption of IoT technologies is proposed.

Index Terms- Internet of Things; Energy platforms; Energy middlewares; Communication protocols; Energy services; Physical layer; Server layer; Application layer; Security

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