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Stack4Things: a sensing-and-actuation-as-a-service framework for IoT and cloud integration

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Abstract

© 2016 Institut Mines-Télécom and Springer-Verlag FranceWith the increasing adoption of embedded smart devices and their involvement in different application fields, complexity may quickly grow, thus making vertical ad hoc solutions ineffective. Recently, the Internet of Things (IoT) and Cloud integration seems to be one of the winning solutions in order to opportunely manage the proliferation of both data and devices. In this paper, following the idea to reuse as much tooling as possible, we propose, with regards to infrastructure management, to adopt a widely used and competitive framework for Infrastructure-as-a-Service such as OpenStack. Therefore, we describe approaches and architectures so far preliminary implemented for enabling Cloud-mediated interactions with droves of sensor- and actuator-hosting nodes by presenting Stack4Things, a framework for Sensing-and-Actuation-as-a-Service (SAaaS). In particular, starting from a detailed requirement analysis, in this work, we focus on the subsystems of Stack4Things devoted to resource control and management as well as on those related to the management and collection of sensing data. Several use cases are presented justifying how our proposed framework can be viewed as a concrete step toward the complete fulfillment of the SAaaS vision.

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Keywords

Cloud, IoT, OpenStack, SAaaS, WAMP, WebSocket