Electricité de France R&D
Département ICAME
7 bd Gaspard Monge
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Proposition de stage de fin d'études 2022-2023
-
SmartMTB: Policy-aware Data Exchange in Multi-tenant IoT-enhanced Buildings

Descriptif

Multi-tenant buildings are typically large and privately owned buildings in which office space (building regions) is rented out to multiple organizations (tenants) [1, 2]. Current deployed Building Management Systems (BMS) and Internet of Things (IoT) devices may belong to either building owners or tenants. Typically, thermal comfort and indoor air quality is ensured via a heating, ventilation, and air conditioning (HVAC) system that belongs to building owners. On the other hand, a zero waste management and recycling system may be deployed from one or more tenants using their own IoT devices. Tenant-based IoT applications can usually be exploited only from members of the corresponding tenant(s) while building-based IoT applications could be exploited from all - or a subset of - building inhabitants depending on the access rights [3, 4].

The goal of this internship is to contribute to SmartMTB, a fair middleware-based system for supporting the deployment of both tenant/building-based IoT applications in multi-tenant smart buildings. Fair data exchange techniques will be introduced based on budget/privacy constraints of tenants and QoS (Quality of Service) requirements of applications.

[1] T. Edwards and W. Kumphai. Sustainability in multi-tenant office buildings: Anatomy of a leed ebom program. Energy Engineering, 109(2):7-23, 2012.
[2] Lizanne Hartog, Minou Weijs-Perree, and Rianne Appel-Meulenbroek. The influence of personality on user satisfaction: multi-tenant offices. Building Research & Information, 46(4):402-416, 2018.
[3] J. Koh, D. Hong, S. Nagare, S. Boovaraghavan, Y. Agarwal, and R. Gupta. Who can access what, and when? understanding minimal access requirements of building applications. In 6th ACM Buildsys, pages 121-124, 2019.
[4] P. Pappachan, M. Degeling, R. Yus, et al. Towards privacy-aware smart buildings: Capturing, communicating, and enforcing privacy policies and preferences. In International Workshop on the Internet of Things Computing and Applications (IoTCA 2017) at the 37th ICDCS, page 6 pages, 2017.

Conditions matérielles

Encadrement :	Georgios BOULOUKAKIS (TSP) et Bruno TRAVERSON (EDF R&D).
Lieu du stage :	EDF R&D, 7 boulevard Gaspard Monge, 91120 Palaiseau.
Durée :	6 mois.
Rémunération :	Approximativement 850 € / mois.
Connaissances requises :	Master 2 ou dernière année d'école d'ingénieurs, anglais, modélisation et programmation objet, système distribué, Semantic Web, Internet of Things.

Renseignements complémentaires

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