Cloud-Based Software Platform for Smart Meter Data Management - DTU Orbit
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Today smart meters are increasingly used in the worldwide. Smart meters are the advanced meters capable of measuring customer energy consumption at a fine-grained time interval, e.g., every 15 minutes. The data are very sizeable, and might be from different sources, along with the other social-economic metrics such as the geographic information of meters, the information about users and their property, geographic location and others, which make the data management very complex. On the other hand, data-mining and the emerging cloud computing technologies make the collection, management, and analysis of the so-called big data possible. This can improve energy management, e.g., help utility companies to forecast energy loads and improve services, and help households to manage energy usage and save money. As this regard, the proposed paper focuses on building an innovative software platform for smart meter data analytics using cloud technologies, aiming to maximize the information assets in demand-side energy management and relieving peak load. The proposed platform will offer information integration pipeline to ingest smart meter time-series data; a secure repository for researchers sharing their knowledge; scalable data analytics platform for data mining over big data sets for energy demand forecasting and consumption discovering; data as the service for other applications using smart meter data; and a portal for visualizing data analytics results. The design will incorporate hybrid clouds, including Infrastructure as a Service (IaaS) and Platform as a Service (PaaS), which are suitable for on-demand provisioning, massive scaling, and manageability. Besides, the design will impose extensibility, efficiency, and high availability on the system. The paper will evaluate the system comprehensively, and compare with other similar works. This paper will provide a proof of concept for building the data management system expanding from the data management of energy sector to the entire sectors of smart cities.

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