A hybrid ICT-solution for smart meter data analytics

Smart meters are increasingly used worldwide. Smart meters are the advanced meters capable of measuring energy consumption at a fine-grained time interval, e.g., every 15 min. Smart meter data are typically bundled with social economic data in analytics, such as meter geographic locations, weather conditions and user information, which makes the data sets very sizable and the analytics complex. Data mining and emerging cloud computing technologies make collecting, processing, and analyzing the so-called big data possible. This paper proposes an innovative ICT-solution to streamline smart meter data analytics. The proposed solution offers an information integration pipeline for ingesting data from smart meters, a scalable platform for processing and mining big data sets, and a web portal for visualizing analytics results. The implemented system has a hybrid architecture of using Spark or Hive for big data processing, and using the machine learning toolkit, MADlib, for doing in-database data analytics in PostgreSQL database. This paper evaluates the key technologies of the proposed ICT-solution, and the results show the effectiveness and efficiency of using the system for both batch and online analytics.