Elastic Semantic Engine for OneM2M Appliations

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***Abstract*—**

***Keywords*-**

I. Introduction

Machine-to-Machine (M2M) applications are more and more popular due to the availability of smart M2M devices (sensors). M2M devices are used in a great deal of realms such as home monitoring, vehicular networks environmental monitoring (weather forecasting), health monitoring. Integrating and processing M2M data from heterogeneous domains is still faced with many challenges.

First, With the advances in M2M domain, more and more smart sensor devices are deployed in the M2M network.It is predicted that within the next decade billions of devices (Cisco predicts that the number of the Internet connected devices will be around 50 Billion by 2020) will generate myriad of real world data for many applications and services in a variety of areas such as smart grids, smart homes, e-health, automotive, transport, logistics and environmental monitoring. Such a stunning number of devices will generate massive data. Secondly, many M2M applications need to gather and combine heterogeneous sensor data with different formats and measurements. Besides that, some large-scale background data also needs to be integrated. Thirdly, most of the M2M data is generated with spatial and temporal annotations, which is used to support all kinds of real-time and location-based applications. For example,

The Semantic Web technologies are viewed as a key for the development of M2M. In specific, it serves as the following three purposes: First, it provide us with a good way to resolve the problems of inter-operability and integration within this heterogeneous world of M2M devices by defining and reusing some standard semantic concepts. Much efforts have been put on the area. For example, ontologies such as the W3Cs SSN ontology (Lefort et al., 2011; Compton et al., 2012) have been developed, which offers a number of constructs to formally describe not only the sensor resources but also the sensor observation and measurement data. Secondly, the Semantic Web provides a seamless interface to facilitate the interactions of M2M data and other existing non-M2M knowledge or services such as Linked Data, DBpedia, LinkedGeodata, various kinds of Web Services and so on. At last, applying the semantic query and reasoning technologies can help us analyze and mine the M2M data to have a better understanding about our physical world.

However, considering the another two characteristics of IOT data: dynamics and scale, current Semantic Web still exists many limitations:

II. RELATED WORK

III. System Architecture

IV. Evaluation

V. Conclusion

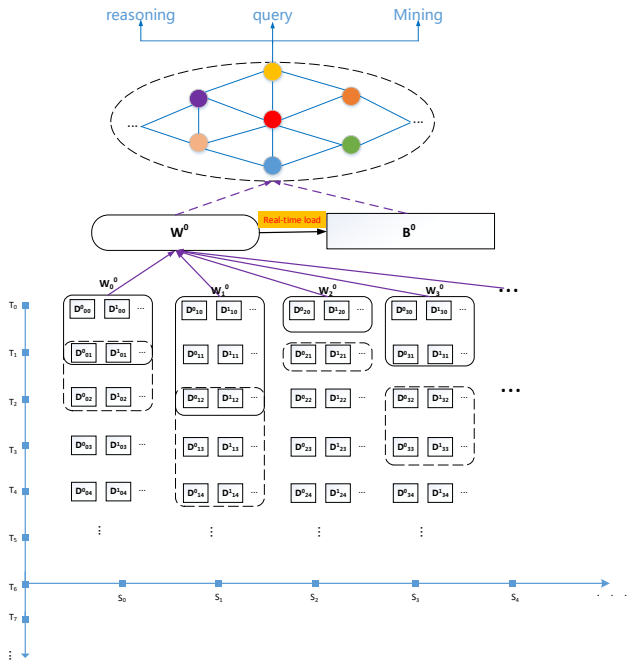

Figure 1. The Architecture of SparkRDF

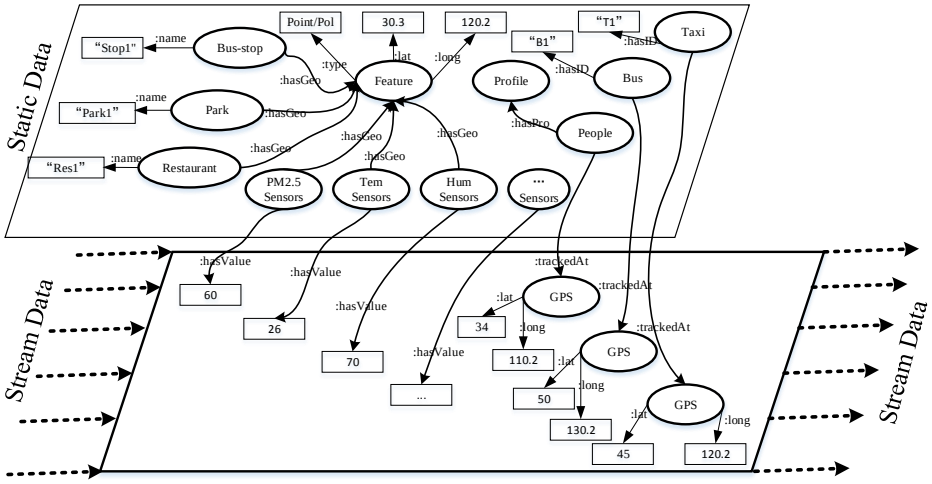

Figure 2. The Architecture of SparkRDF