An Architecture for Managing Knowledge and System Dynamism in the Worldwide Sensor Web

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Abstract

Sensor Web researchers are currently investigating middleware to aid in the dynamic discovery, integration and analysis of vast quantities of both high and low quality, but distributed and heterogeneous earth observation data. Key challenges being investigated include dynamic data integration and analysis, service discovery and semantic interoperability. However, few efforts deal with managing knowledge and system dynamism. Two emerging technologies that have shown promise in dealing with these issues are ontologies and software agents. This paper presents an integrated ontology driven agent based Sensor Web architecture for managing knowledge and system dynamism. An application case study on wildfire detection is used to illustrate the operation of the architecture.