

Towards an Easy Integration of Geosensors into the Sensor Web

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In the past, a multitude of projects have demonstrated the applicability of OGC's Sensor Web standards. The Sensor Web encapsulates heterogeneous geosensors for web-based discovery, access, tasking, and alerting. Thereby, the geosensors need to be integrated manually into each node of the Sensor Web. This approach is cumbersome and leads to an extensive integration effort in large scale sensor network systems incorporating many different types of sensors. This is due to a conceptual gap between the layer of the geosensor network and the layer of the Sensor Web. Aim of this work is to close this gap by establishing an intermediary layer, which integrates new geosensors into the Sensor Web.

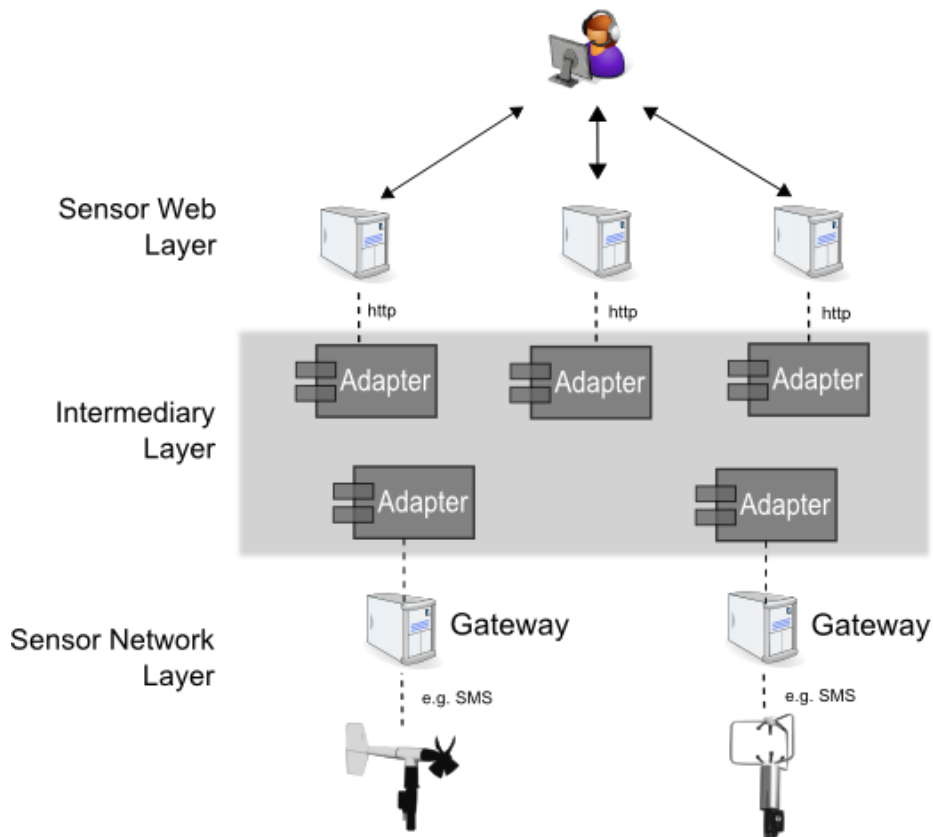


Figure 1: Overview of the intermediary layer.

Firstly, a conceptual foundation for the intermediary layer as outlined in Figure 1 is developed. This includes the design of interaction patterns as

described by Broering et al. (2010). Independent of a certain technical realization, different interaction patterns can be identified between the two layers to enable the core functionality of the Sensor Web. These patterns comprise the sensor registration at the intermediary layer, data publication as well as the tasking of sensors.

The analysis, design and implementation of the intermediary layer comprises the definition of a communication protocol which can be used to realize a publish/subscribe architecture. This protocol defines the encoding of messages to register new sensors and services, publish sensor observations and parameterize or task sensors and transducers. The message transfer of the intermediary layer is based on a push-based mechanism.

The intermediary layer needs to be based on a generic architecture, which allows an integration of new sensors with a low amount of work. Therefore, pluggable sensor adapters are designed, which allow sensor vendors to easily integrate sensors into the intermediary layer and finally become available on the Sensor Web.

The intermediary layer is published as an open source project within the 52° North Sensor Web community (<http://www.52north.org/swe>). Currently, basic implementations are under development. Next, mechanisms for true *sensor plug & play* will be developed. Soon, the approach will be applied to the existing water gage network of the regional German watershed monitoring agency Wupperverband to demonstrate its applicability in real-world scenarios.

REFERENCES

Broering, A., T. Foerster, and S. Jirka (2010), "Interaction Patterns for Bridging the Gap between Sensor Networks and the Sensor Web," in WoT 2010: First International Workshop on the Web of Things, Mannheim, Germany, March 29. - April 2. 2010; forthcoming.