UNIQUE URIs FOR SENSOR CONTENT AND CONTEXT LINKING

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Autonomous ocean observation is massively increasing the number of sensors in the ocean. As new sources of information are identified, selecting sensors that are fit for purpose becomes a growing challenge. Sensor metadata, which constitute the sensor's context, support scientists on selecting quality sensor content (data). The Open Geospatial Consortium (OGC) has developed the Sensor Web Enablement (SWE) standards to facilitate integration and interoperability of sensor data and metadata. World Wide Web Consortium (W3C) Semantic Web technologies enable machine comprehensibility promoting sophisticated linking and processing of data published on the web. There are some practical difficulties when linking sensor content and context according to the above-mentioned standards, because of internal hardware bandwidth restrictions and a requirement to constrain data transmission costs.

Our approach addresses these practical difficulties by uniquely identifying sensor and platform models and instances through URIs, which resolve via content negotiation to either OGC's sensor meta language, sensorML or W3C's Linked Data. Sensor and platform model URIs and descriptions are created and hosted by the British Oceanographic Data Centre (BODC) linked systems service. Sensor and platform instance URIs are dynamically created prior and during sensor deployment, by the sensor owner, and are associated with the relevant model URI through an updatable web form, the Sensor Instance Form. Association among platform and sensor URIs is also performed by the end user, representing deployment. When sensors transmit their content, they include their unique URI to refer to their context. The use of URIs and the Sensor Instance Form offers both practical and economical benefits to the implementation of SWE and Linked Data standards in near real time systems. Data can be linked to metadata dynamically in-situ while saving on the costs associated to the transmission of long metadata descriptions. The transmission of short URIs also enables the implementation of standards on systems where it is impractical, such as legacy hardware.