



## Using URIs to effectively transmit sensor data and metadata

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Autonomous ocean observation is massively increasing the number of sensors in the ocean. Accordingly, the continuing increase in datasets produced, makes selecting sensors that are fit for purpose a growing challenge. Decision making on selecting quality sensor data, is based on the sensor's metadata, i.e. manufacturer specifications, history of calibrations etc. The Open Geospatial Consortium (OGC) has developed the Sensor Web Enablement (SWE) standards to facilitate integration and interoperability of sensor data and metadata. The World Wide Web Consortium (W3C) Semantic Web technologies enable machine comprehensibility promoting sophisticated linking and processing of data published on the web. Linking the sensor's data and metadata according to the above-mentioned standards can yield practical difficulties, 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. Data transmitted by a sensor incorporate the sensor's unique URI to refer to its metadata. Sensor and platform model URIs and descriptions are created and hosted by the British Oceanographic Data Centre (BODC) linked systems service. The sensor owner creates the sensor and platform instance URIs prior and during sensor deployment, through an updatable web form, the Sensor Instance Form (SIF). SIF enables model and instance URI association but also platform and sensor linking. The use of URIs, which are dynamically generated through the SIF, 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.