

# Open Sensor Web Architecture Core

## Middleware: Sensor Collection Service

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### Abstract

A new trend called Sensor Web that is to make all types of web-resident sensors, instruments, and image devices as well as repositories of sensor data discoverable, accessible and where applicable, controllable via the World Wide Web has been emerging. A lot of efforts have been made to overcome the obstacles connecting and sharing the heterogeneous sensor resources. Open GIC Consortium (OGC) has introduced Sensor Web Enablement (SWE) concept that is actually a set of specifications including SensorML, Observation & Measurement, Sensor Collection Service, Sensor Planning Service and Web Notification Service to implement the Sensor Web. The Open Sensor Web Architecture (OSWA) proposed by NICTA, at University of Melbourne extends the SWE and further integrates the Sensor Web and Grid Computing as well as providing middleware support of Sensor Web. This work identifies the key technologies that may be adopted by implementing the OSWA and designs and implements the core middleware Sensor Collection Service in OSWA. The SCS has been deployed as Web Services to support both auto-sending and query based sensor applications running on top of TinyOS. A simple temperature monitoring sensor application has also developed and deployed onto the Crossbow's motes. Moreover, the SCS has been tested under both real sensor hardware provided by Crossbow's Development Kit as well as a simulation environment called TOSSIM. Performance evaluation has also been conducted in our experiment to demonstrate the capability and scalability of the service.