An Application Framework for Integrating Wireless Sensor and Actuator Networks for Precision Farming as Web of Things to Cloud Interface Using Platform as a Service

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Abstract : The advances in sensor and embedded technologies have led to rapid developments in Wireless Sensor Networks (WSNs). Presently researchers focus on the integration of WSNs to Internet for their pervasive availability to access these network resources as the interoperable subsystems. The recent computing technologies like cloud computing has made the resource sharing as a converged infrastructure with required service interfaces for the shared resources over the Internet. This paper presents application architecture for wireless Sensor and Actuator Networks (WSANS) following web of things, which allows easy integration of each node to the Internet in order to provide them web accessibility. The architecture enables the sensors and actuator nodes accessed and controlled using cloud interface on WWW. The application architecture was implemented using existing web and its emerging technologies. In particular Representational State Transfer protocol (REST) was extended for the specific requirements of the application. Cloud computing environment has been used as a development platform for the application to assess the possibility of integrating the WSAN nodes to Cloud services. The mushroom farm environment monitoring and control using WSANs has been taken as a research use case.

Keywords : WSAN, REST, web of things, ZigBee, cloud interface, PaaS, sensor gateway

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