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Using Software-Defined Networking Technology for Delivering Software Updates to Wireless Sensor Networks

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The current paper proposes a system architecture where a distributed environment of wireless sensor networks (WSNs) can selectively receive software updates when enhanced with a Software-Defined Network (SDN) control environment. In the context of IoT, the current work aims to facilitate the deployment of software updates on WSNs in an automated fashion and also proposes the usage of this architecture in large scale business networks, where different areas of the same network may change their purpose at different times during the network lifecycle. A central component oversees the coordination of each WSN, but each WSN is responsible for retrieving its updates from the storage location. For security, the software updates are stored in a remote peer-2-peer storage location. A simulation environment is also presented which uses Mininet-Wifi as a WSN emulator with Pox controller as SDN enabler and uses the IPFS network as a remote peer-2-peer storage. The Pox controller's host_tracker module is enhanced with features to retrieve the updates from the IPFS network and to deliver the retrieved information to each station on the network. The simulations show that information can be delivered with relatively small network overhead and changes to the Pox controller, making this a viable solution for delivering updates to WSNs.

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