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Abstract خلاصة	• Wireless Sensor Network (WSN) is an essential technology in many Internet of Things (IoT) applications, and since sensor nodes suffer from limited resources, it has become possible to overcome storage capacity problems using cloud computing, the integration of Internet of Things (IoT) with cloud computing (CC) seeks to achieve new levels of efficiency in service delivery. Security and privacy are key factors that slow down the rapid and widespread adoption and deployment of both IoT and cloud computing. In the proposed model, an integrated IoT system with cloud computing was developed starting from the analysis, and design, to the implementation to connect IoT devices with the cloud, the security is achieved by using a hybrid encryption mechanism which provides the performance advantages of symmetric and asymmetric encryption algorithms. • Where the Elliptic Curve Cryptography (ECC) algorithm is used for key generation and AES (Advanced Encryption Standard) algorithm is used for encryption and decryption of the sensors' data to provide a reliable computing environment. We have implemented the proposed system and showed the results of using CONTIKI COOJA 3.0 that connected with the cloud service provider, evaluate a set of performance metrics such as power consumption, packet delivery ratio, and the algorithm execution time, in addition to verifying network immunity against the black hole attack.