**LBOA: Location-Based Secure Outsourced Aggregation in IoT**

**Abstract:**

 Secure outsourced aggregation in the Internet of Things (IoT) can solve the problem that sensing devices are limited in energy and bandwidth by outsourcing data aggregation task to a third-party service provider. Location-based secure outsourced aggregation (LBOA), aggregating data whose location satisfies user's location strategy, is very important in some location-critical scenarios (e.g., smart homes, intelligent transportation, and smart city). Recent work studied secure data aggregation to reduce transmission overhead and network bandwidth by optimizing topology of networks or adopting the cryptographic approach. However, as far as we know, scarcely any work considers the location information of the data source and the privacy protection of the data at the same time in the studies of secure outsourced aggregation. In this paper, we first propose an LBOA scheme LBOA Max , which can return the maximum value of sensory data whose location satisfies location strategy by applying one-way chain, order-preserving encryption, and some other cryptographic operation. Then, we proposed scheme LBOA Top-k and scheme LBOA Sum , which can return the largest k values of data and the summation value of data based on location, respectively. The security analysis results show that our schemes can satisfy the defined requirements and the experiment results show that our schemes are feasible and efficient for each entity in practice.

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Pentium Dual Core.
* Hard Disk : 120 GB.
* Monitor : 15’’ LED
* Input Devices : Keyboard, Mouse
* Ram : 1 GB

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows XP/UBUNTU.
* Implementation : NS2
* NS2 Version : 2.28
* Front End : OTCL (Object Oriented Tool Command  Language)
* Tool : Cygwin (To simulate in Windows OS)