

ABSTRACT

User needs for Internet of Things (IoT) services are currently increasing along with the development of the current industrial system. The increase in the number of users can result in an increased server performance load accompanied by the threat of data theft that is important to the IoT server. So, a system is needed to balance the load on server performance along with a data encryption process.

In this final project, a system design will be carried out to share the load on the server performance using the load balancing method along with the encryption process on the telemedicine system server based on IoT technology. The load balancing system used is by using the NGINX software, while for the data security section, it uses a homomorphic encryption algorithm from the AES ciphertext sent from the sender. The load balancing server will divide the data request process to two different servers where both servers have an API that is created using a web framework called Flask. After that, the data will be processed using homomorphic encryption to calculate the average value of the data and will be saved to the MongoDB database.

In testing this final project, the authors analyzed the error requests received by both servers for the GET and POST methods on the Hyper Text Transfer Protocol (HTTP) and analyzed the speed of encryption and decryption of homomorphic encryption data. The results of this final project indicate that the error request for the GET method after using load balancing server has decreased by 97%, while for the POST method also decreased by 66.75%. The encryption process shows that the average time of homomorphic encryption speed is 15.66 ms, the homomorphic processing time is 764.18 μ s, and the homomorphic decryption time is 362.49 μ s.

Key words: *Internet of Things, load balancing, server, request, enkripsi homomorfik, AES.*