ABSTRACT

Cloud computing is a general term related to transmission using hosted service over the internet. Cloud Computing uses a network of remote servers far from users, rather than using a local server. However, the cloud computing still has several shortcomings, namely the latency and bandwidth used are quite high. Then, fog computing is developed in order to solve those previous aforementioned. Fog assists the cloud by processing and computing data locally and then sends them to the cloud. As a consequence, resources and time spent are less than all processes charged to the cloud.

This final project focuses on authentication between fog nodes for supporting microservices migration when user move to another location. The authentication scheme in this final project is that the fog that has been connected with the user will send a challenge to the new fog to make sure the new fog is reliable. For the authentication process, we use two challenge-response types operations, which are bitwise and arithmetic. After the two fogs are connected, the new fog will send a message asking for confirmation to the user if there is an configuration adjustment to the service. After that, the user is able to connect with the new fog.

In this this final project the average delay during verification process between bitwise and arithmetic is 3.94 ms and 3.53 ms. The average delay of validation process between bitwise and arithmetic is 0.393 ms and 0.34 ms. The difference of total delay between the two operations schemes is 0.46 ms that make the process of operations arithmetic faster than the bitwise. In the aggregation process, the delay is 2.86 ms when the user starts to connect with the new fog.

Keywords: *Cloud Computing*, *Fog Computing*, *Authentication*, *Agreggation.*