

## ABSTRACT

*Voice over Internet Protocol (VoIP)* is one of the most effective solution in the telecommunications activity on the Internet because it has characteristics that are quite diverse. Users can interact to each other using voice features, VoIP makes one of the best applications where its application is always used by people worldwide. This is why the experts the latest technological innovations in order to make use of as well as customer loyalty is maintained.

Increasing number of users to access the same application will affect the quality and the level of security in a network of quality, both in terms of the connection between the user and system applications work itself. To minimize the burden of an application, *Authentication, Authorization, and Accounting (AAA)* services is built which manages the effectiveness of ownership and manage or adjust the level of usage among users. With these service providers can implement tariff system to the user, either prepaid or postpaid.

In this thesis, the author analyzed the design and pricing system in VoIP applications using the protocol *Remote Authentication Dial In User Service (RADIUS)*, which has been referred to the AAA service. Then, *OpenSIPS* is implemented as VoIP server. Further on different platforms, *FreeRADIUS* also built as RADIUS server that run along *CDRTool* as a provider of web-based pricing system.

In the performance test results, it is concluded that the pricing system can work in accordance with the expected result should be, both pricing based on the type of network and based on the allocation of time in a day. Specifically for performance, also concluded that the pricing accuracy testing is proved. Post Dial Delay values are 13.3 ms, 110.7 ms, 119.6 ms, 126.55 ms, and 141.8 ms for each background traffic volume 0MB, 20MB, 40MB, 60MB, and 80MB. Value differences in CPU and memory usage when idle is 0.10% and 3MB respectively, and 0.03%, and 8MB respectively while application is running.

Keywords: VoIP, AAA, RADIUS, billing system