

## ABSTRACT

*Easyness and security on communication is one of the vital parts in the world of communication technology. Along the development of internet technology, communication technology also continue to participate in this growth, some of those communication may include voice, data, and video. Voice communication technology over the Internet is called Voice over Internet Protocol (VoIP). The easyness of communication is one of the demands is important because user do not like a convoluted process to perform a communication. The user only wants to use technology to communicate in a way that is easy and simple. Along with the development of the communication technology appeared some new problems, one of which is the security aspect. When users increasing in a service then the threat is also increasing . VoIP communication service users do not want communications that are essential intercepted by irresponsible parties. While on other issues, the number of VoIP service providers in Indonesia itself is very minimal.*

*In this final project designed a VoIP server using opensource Asterisk server that integrates with PHP-based interface. Web self-registration user interface that was built protected by the SSL security protocol. VoIP Server is built is also integrated with VPN-based OpenVPN to secure communication between users. When the server was built, carried out an analysis of the security aspects during communication. VoIP data security testing will be done by sniffing methods, then will be tested by rewond the package for the Real Time Protocol (RTP) delivered, including performance analysis will be performed VoIP communication itself. Additionally, it will do the analysis of server performance with high traffic load to see the reliability of the server side that has been built.*

*From the test results it can be concluded that the making of the web interface to make the process of self-register can facilitate the use of VoIP services. With the addition of VoIP services solution OpenVPN can provide the security aspects of the integrity, confidentiality, and authrntication in VoIP communications. From the measurement results obtained communication quality VoIP QoS lowest quality on the use OpenVPN cipher AES-256-CBC is with a delay of 9.451999792 ms, 0.000287304 ms jitter, packet loss 0%, and MOS 0.11495 throughput of 4.068656581.*

*Keywords: VoIP, PHP, VPN, OpenVPN, SSL, QoS*