

## **ABSTRACT**

*Security becomes a very vital part in the development of computer networks. Security is needed for various types of communications, such as voice, video and data. With the development of Internet technology, then in the development of VoIP and Cloud Computing network. There are several methods for securing VoIP communications on the network cloud. One of them uses SRTP and TLS, the protocol has been able to secure VoIP communications is well, but if VoIP server is placed on the system or network Cloud, will be very vulnerable to attack on the server side it. There is also a VPN technology to secure VoIP communications, but because during the VoIP server itself is not in place it on the system or network cloud the benefits of a VPN system had not yet reached a maximum. On the other hand Cloud Computing Virtualization technology can already be used for VoIP infrastructure at a large scale.*

*In this final project is implemented Infrastructure As A Service on Cloud Computing system using Proxmox VE as virtualization software. VoIP server and OpenVPN-based VPN systems, SSTP, and IKEv2 / IPSec as supporting VoIP communications security and Cloud systems. Security aspects will be analyzed VoIP server from DDoS attacks and VoIP communication with sniffing method will then try backing playback RTP packet sent. Included also will be analyzed aspects of performance VoIP communications itself. Scenarios will be done with and without the use of VPN systems.*

*From the test results it can be concluded that the addition of VPN on the server Asterisk-based Cloud Computing will add aspects of integrity, confidentiality, and authentication on VoIP communications, while the results of measurements of quality of VoIP communications obtained lowest quality of QoS is delay 44 ms, jitter 0.99 ms, packet loss 0% and MOS 4.01. The performance of various VPN systems almost the same and VPN solutions can not only secure communications of VoIP itself but also useful for securing VoIP servers from DoS attacks.*

*Keywords: Cloud Computing, VoIP, VPN, OpenVPN, SSTP, IKEv2, QoS, DoS*