

## ABSTRACT

Internet Protocol (IP) which is very easy to develop makes it way to popularity. So it makes the development trend of next generation communication heads to IP-based communication. Voice communication over IP usually called VoIP (Voice over IP).

VoIP is a form of IP-based communication which starts to get very popular. Beside the massive growth of Internet users, VoIP is easy to use, and much cheaper than the older system such as PSTN. But from all those advantages, VoIP communication also has its weaknesses, security and *privacy* aspect is one of them.

In this final project entitled "Implementation of VoIP SIPI Using Datagram Transport Layer Security (DTLS) on Asterisk Server" has been implemented a VoIP communication network that is secured from common attacks and disturbance on a VoIP call service. The usage of VoIP is based on datagram, so it needs the right form of protection that secure datagram-based services. With the DTLS being implemented, the goal is to secure the system from penetration tester tools and narrow down the attack possibilities from being successful. From the test results, it can be concluded that the addition of DTLS-SRTP will add *privacy, integrity, communication security, and data confidentiality* aspects to the server and the media channel, while the quality of the measurement results obtained VoIP communication average delay of 14 ms, average jitter of 0,2 ms, packet loss at 0% and throughput of 0,094 MBps by using PCMU G.711 audio codec and with the additional security protocol, DTLS-SRTP.

Keywords : VoIP, SIP, DTLS, DTLS-SRTP, Asterisk