

## **ABSTRACT**

Nowadays user need of multimedia services that led to the concept of IP Multimedia Subsystem technology that complements the Next Generation Network technology. With the IMS technology is increasingly helping the user to communicate with multimedia service. VoIP and video call is some of the various services that are supported by the IMS architecture. Kamailio SIP Server that can integrate with the IMS architecture. With the Kamailio SIP Server on IMS architecture is therefore the existence of a guarantee of QoS and capable of handling up to thousands of calls per second.

In this research implemented Kamailio SIP server to build architecture of IP Multimedia Subsystem (IMS) using VoIP and video call as its services. The CPU usage, memory usage, emulate call, MOS, as well as some QoS parameters such as delay, jitter, packet loss, and throughput that is used to view the performance from the Kamailio SIP Server in implementing IMS architecture with VoIP and video call for the services.

From the measurement of QoS parameters, the current state of the system is given the background traffic 80 Mbps, the value of the largest one-way delay and jitter for VoIP service with a value delay is 66.1850 ms and jitter is 0.00345 ms and then to the video call service that is the value of a delay is 84.4925 ms and 0.00982 ms of the jitter. The amount of throughput on a VoIP service with background traffic given by 0 Mbps - 80 Mbps throughput is inversely proportional to the value that is 0.085657 Mbps until 0.08599 Mbps. Similarly, in the video call service are at intervals is 0.1990 Mbps until 0.1463 Mbps. While the largest percentage of success rate obtained is 94.07% which is obtained when in a state of 15000 calls/s. When these conditions, the value of the CPU usage obtained by the 39.6 % and memory usage of 692 MB.

**Keywords** : Kamailio, SIP, IMS, NGN, VoIP, Video Call, QoS